FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8

CERTIFICATION TEST REPORT

FOR

2x2 802.11a/b/g/n +BT Module (SiP)

MODEL NUMBER: QCA6234

FCC ID: PPD-QCA6234
IC: 4104A-QCA6234

REPORT NUMBER: 13U14995-1

ISSUE DATE: JULY 1, 2013

Prepared for
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1700 TECHNOLOGY DRIVE
SAN JOSE, CA 95110

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Revision History

Rev.	Issue Date	Revisions	Revised By
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: QUALCOMM ATHEROS, INC
1700 TECHNOLOGY DRIVE
SAN JOSE, CA 95100

EUT DESCRIPTION: 2x2 802.11a/b/g/n +BT Module (SiP)

MODEL: QCA6234

SERIAL NUMBER: 75720088, 75720080

DATE TESTED: April 19 - May 24, 2013

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 8	Pass
INDUSTRY CANADA RSS-GEN Issue 3	Pass

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

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UL Verification Services Inc.

Tested By:

TONY WAGONER
EMC ENGINEER
UL Verification Services Inc.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2009, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

Uncertainty figures are valid to a confidence level of 95%.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is 2x2 802.11a/b/g/n +BT Module (SiP).

Three board variants are provided, no filter version, 3G filter version and LTE filter version. Test was done to worst case among the three boards.

The radio module is manufactured by Qualcomm Atheros, Inc.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

2400 - 2483.5 MHz Authorized Frequency Band					
Frequency Range (MHz)	Mode	Power Chain 0 (dBm)	Power Chain 1 (dBm)	Total power (dBm)	Total power (mW)
2412 - 2462	802.11b CDD 2TX	20.67	19.62	23.19	208.30
2412 - 2462	802.11g Legacy 2TX	26.30	25.36	28.87	770.14
2412 - 2462	802.11n HT20 CDD 2TX	25.78	24.76	28.31	677.67
5725 - 5850 MHz Authorized Frequency Band					
Frequency Range (MHz)	Mode	Power Chain 0 (dBm)	Power Chain 1 (dBm)	Total power (dBm)	Total power (mW)
5745 - 5825	802.11a CDD 2TX	20.92	22.11	24.57	286.15
5745 - 5825	802.11n HT20 CDD 2TX	22.43	22.41	25.43	349.17
5755 - 5795	802.11n HT40 CDD 2TX	22.45	23.33	25.92	391.07

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5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The declared antenna gain is 2dBi, this antenna gain was used for conducted spurious/band-edge calculations.

5.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was ART2-GUI version 2.3, CART version 4.4

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that Z orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z orientation.

A baseline scan was performed on various data rates for 11b and 11g modes, it was found that when Peak detector was used for the test item the highest data rate was worst-case, and when the AVG detector was chosen for a certain test item the lowest data rate was worst-case, and since the items with AVG detector had lower margin and they were more critical, lowest data rates, as follows, were selected for performing the final measurements:

802.11b mode: 1 Mbps
802.11g mode: 6 Mbps
802.11a mode: 6 Mbps
802.11n HT20mode: MCS0
802.11n HT40mode: MCS0

Three board variants are provided, no filter version, 3G filter version and LTE filter version. Test was done to worst case among the three boards.

Protocol used for spurious and harmonics was conducted measurements + cabinet radiated emissions with 50 ohm load.

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Lenovo	T410 Thinkpad	R8-V8D76 11/03	DoC
SD Card Express Adapter	Bplus	EC230	1100319	N/A

I/O CABLES

Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	AC Adapter	Un-Shielded	1m	NA
2	DC	1	DC	Un-Shielded	1.5m	NA
3	AC	1	AC Adapter	Un-Shielded	1m	NA

TEST SETUP

The EUT is installed in a host laptop computer during the tests. Test software exercised the radio card.

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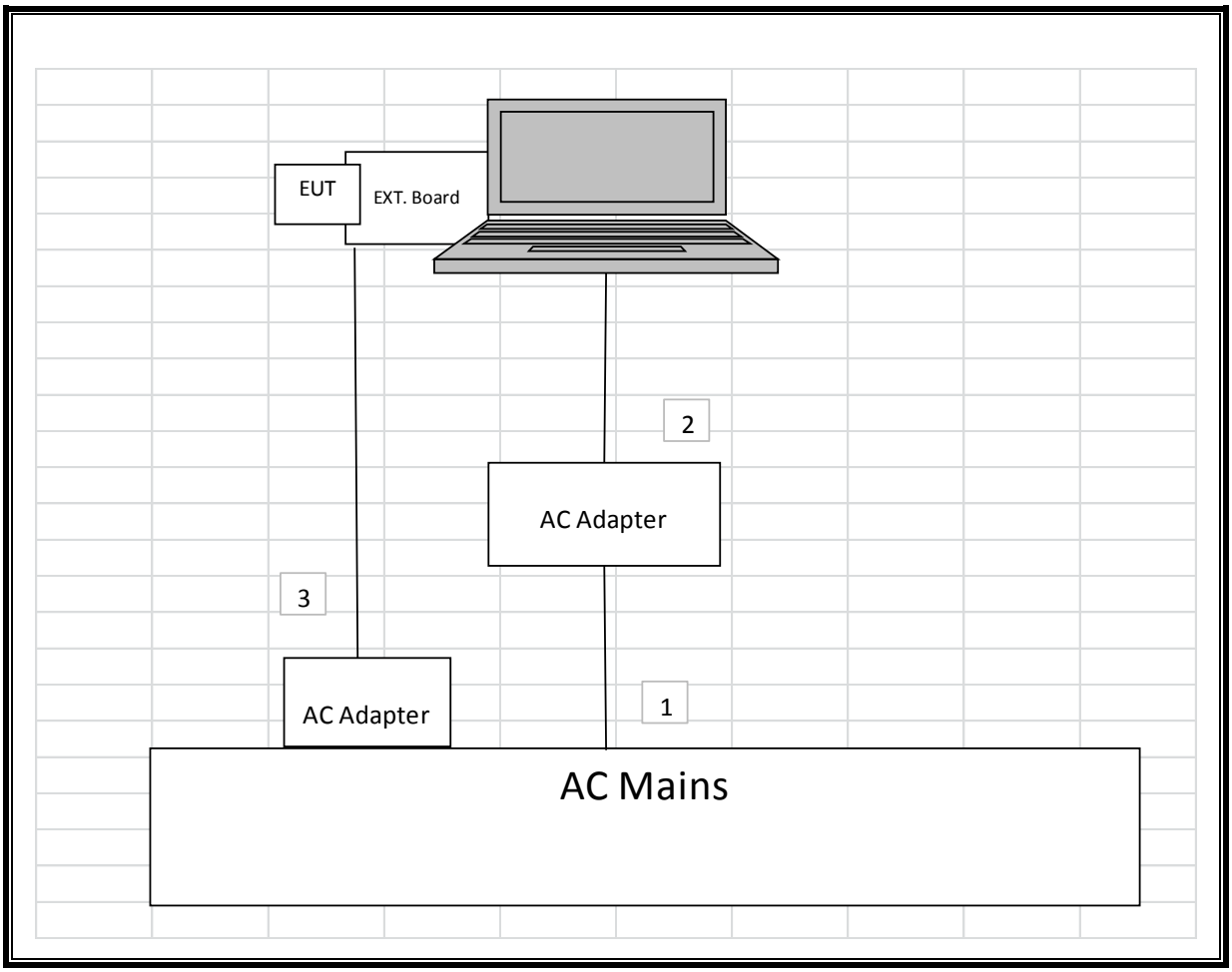
SETUP DIAGRAM FOR TESTS



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6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List					
Description	**Manufacturer**	**Model**	**Asset/ T number**	**Cal Date**	**Cal Due**
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/12	12/20/13
Spectrum Analyzer	Agilent	N9030A	T313	02/22/13	02/22/14
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01179	02/26/13	02/26/14
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01161	05/07/13	05/07/14
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	T243	03/06/13	03/06/14
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C01171	02/13/13	02/13/14
Antenna, Horn, 18 GHz	ETS	3117	C01006	12/11/12	12/11/13
Horn Antenna, 1-18GHz	ETS Lindgren	3117	T344	02/19/13	02/19/14
Horn Antenna, 1-18GHz	ETS Lindgren	3117	T345	02/19/13	02/19/14
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	11/14/12	11/14/13
Antenna, Horn, 40 GHz	ARA	MWH-2640/B	C00981	06/14/11	06/14/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00580	01/28/13	01/28/14
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00558	03/23/13	03/23/14
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	10/22/12	10/22/13
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	10/19/12	10/19/13
PreAmplifier, 1-26.5GHz	Agilent	8449B	T402	03/23/13	03/23/14
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	08/02/11	08/02/13
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/12	12/13/13
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/12	12/13/13
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/13	01/14/14
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/08/12	08/08/13

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7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

7.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
802.11b	12.170	12.240	0.994	0.994	0.000	0.010
802.11g	2.025	2.085	0.971	0.971	0.127	0.494
802.11n HT20, 2.4 GHz band	1.887	1.947	0.969	0.969	0.136	0.530
802.11a	2.026	2.061	0.983	0.983	0.000	0.010
802.11n HT20, 5.8 GHz band	1.887	1.923	0.981	0.981	0.000	0.010
802.11n HT40, 5.8 GHz band	0.127	0.162	0.782	0.782	1.067	7.886

7.2. MEASUREMENT METHOD

6 dB BW: KDB 558074 D01 v03r01, Section 8.1.

Output Power: KDB 558074 D01 v03r01, Section 9.1.2.

Power Spectral Density: KDB 558074 D01 v03r01, Section 10.2.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v03r01, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r01, Sections 12.1. and 12.2.

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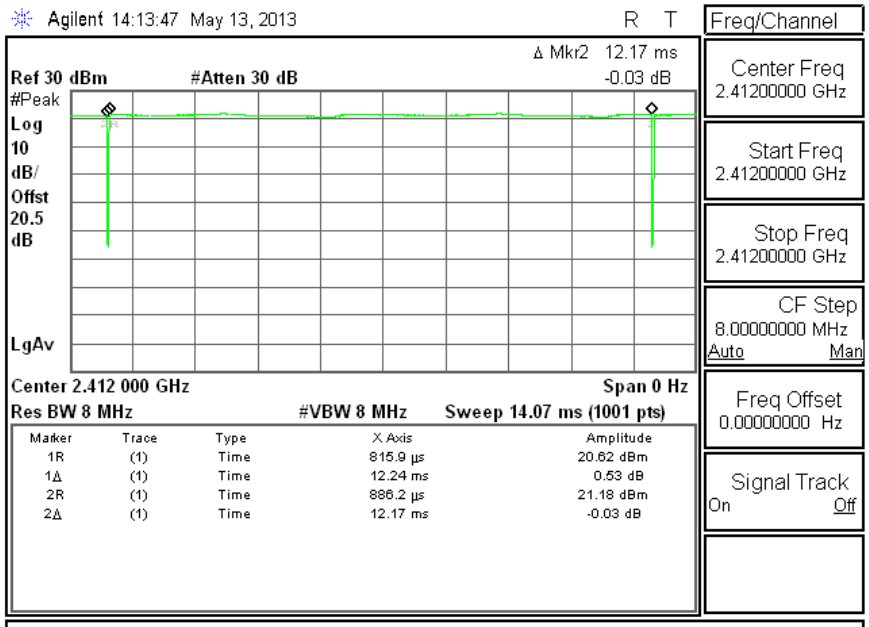
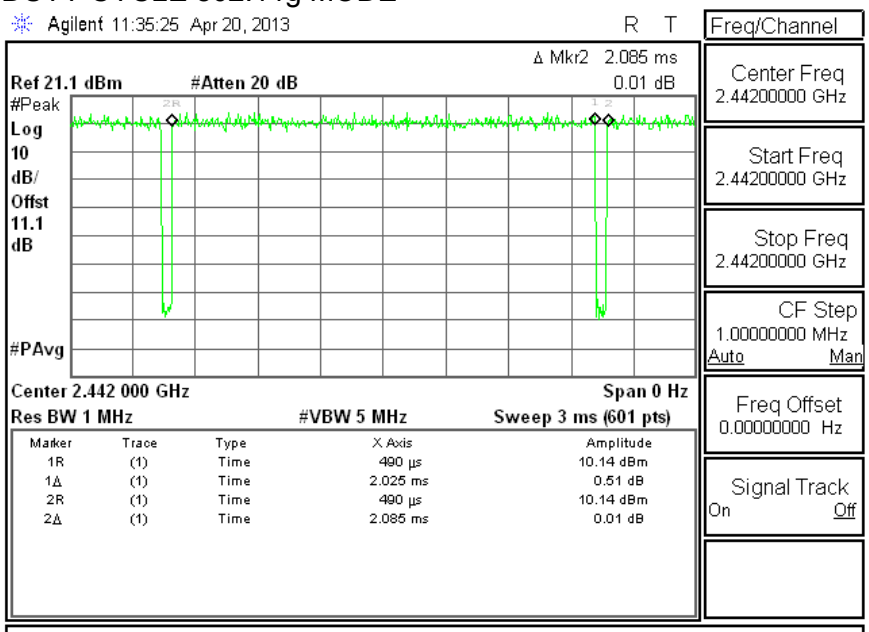
7.3. 2.4 GHz DUTY CYCLE PLOTS

DUTY CYCLE 802.11b MODE



DUTY CYCLE 802.11g MODE



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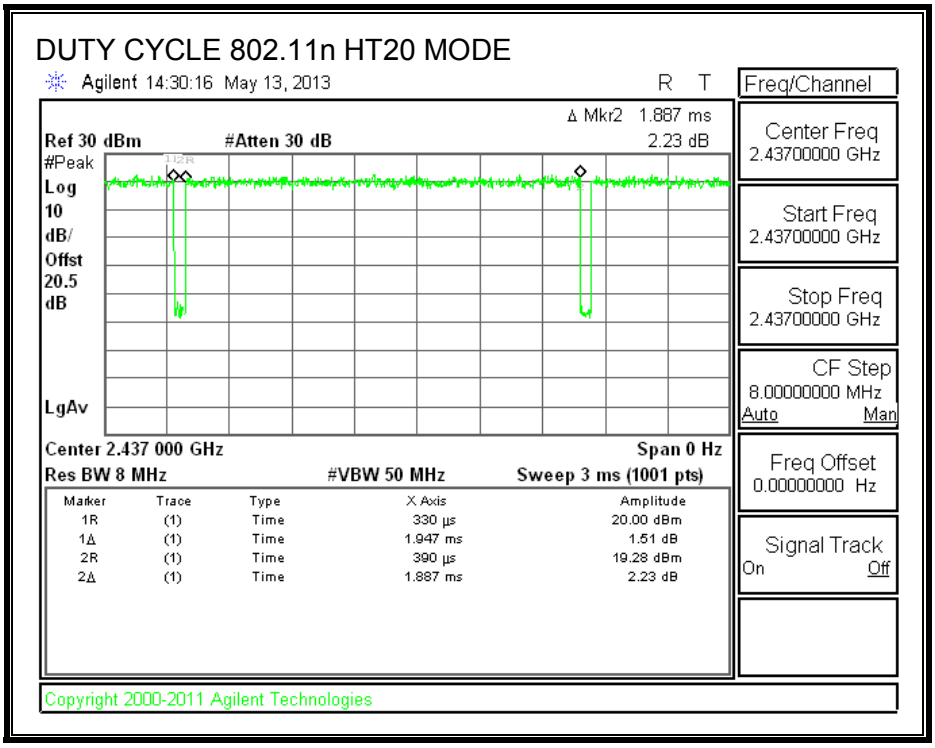
DUTY CYCLE 802.11n HT20 MODE



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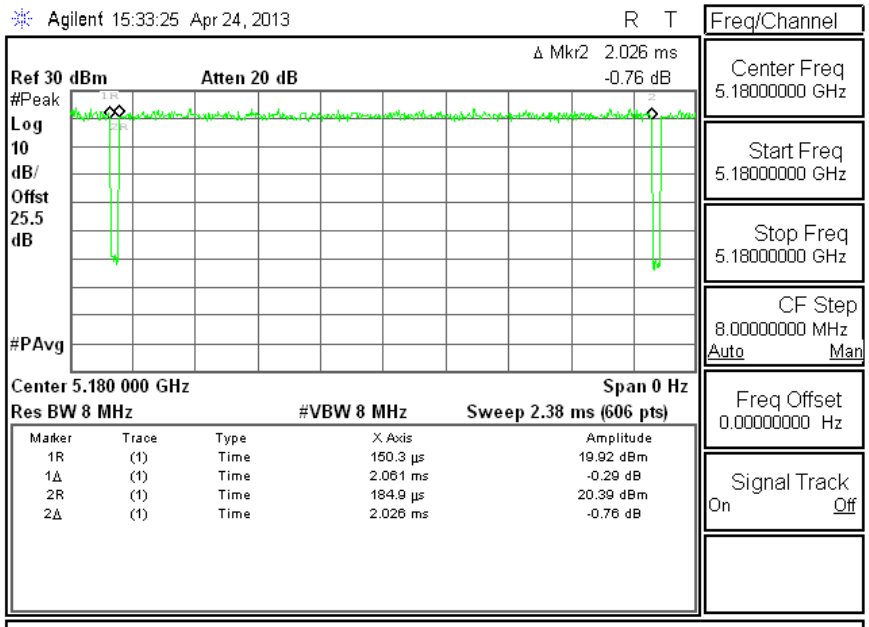
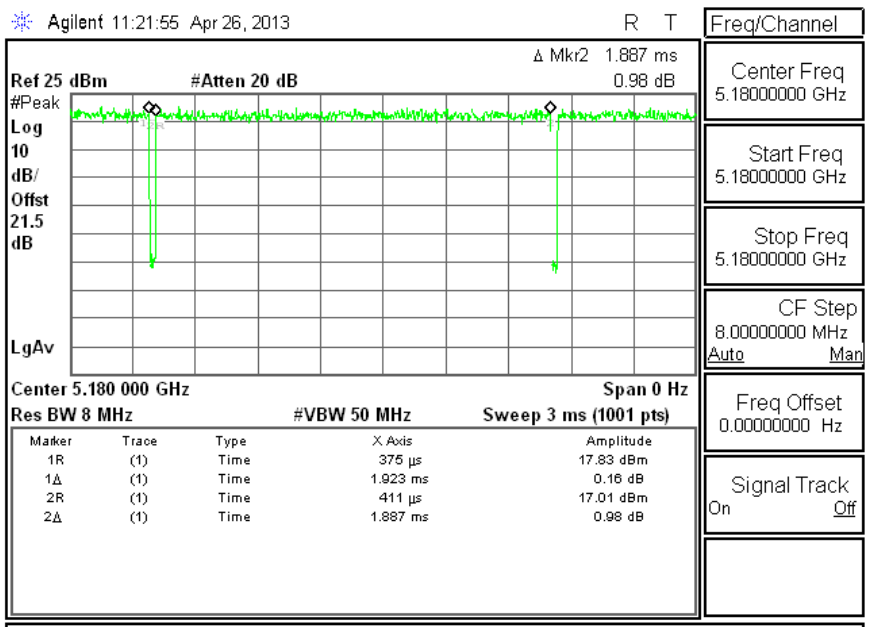
7.4. 5.8 GHz DUTY CYCLE PLOTS

DUTY CYCLE 802.11a MODE



DUTY CYCLE 802.11n HT20 MODE



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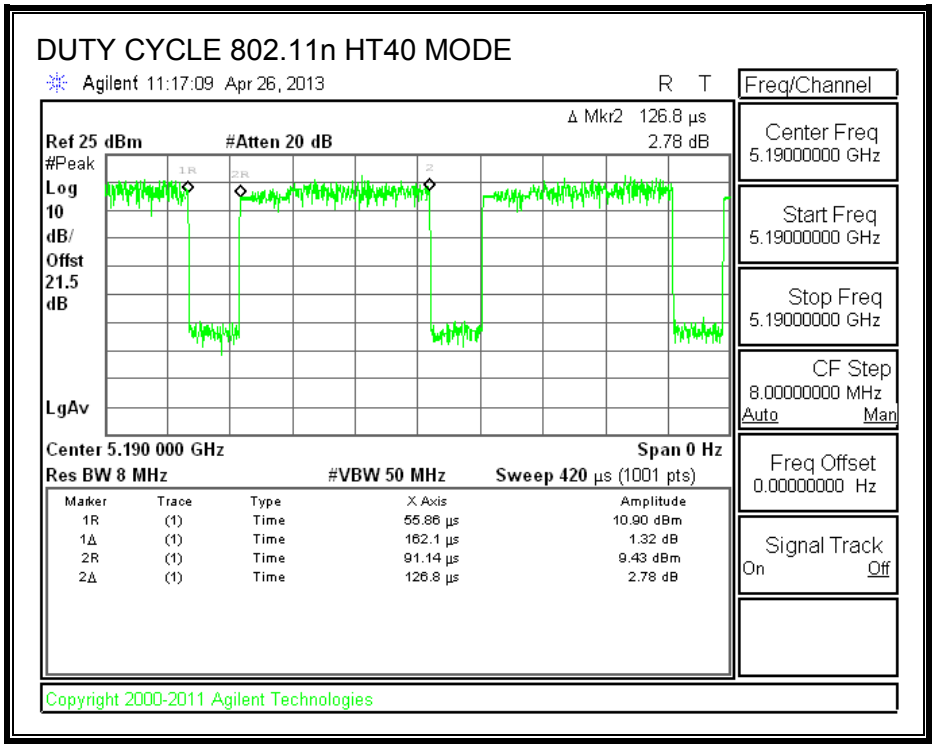
DUTY CYCLE 802.11n HT40 MODE



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8. ANTENNA PORT TEST RESULTS

8.1. 802.11b MODE IN THE 2.4 GHz BAND

8.1.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	2412	7.223	7.205	0.5
Low	2417	7.187	7.205	0.5
Mid	2437	7.223	7.220	0.5
High	2457	7.205	7.205	0.5
High	2462	7.223	7.205	0.5

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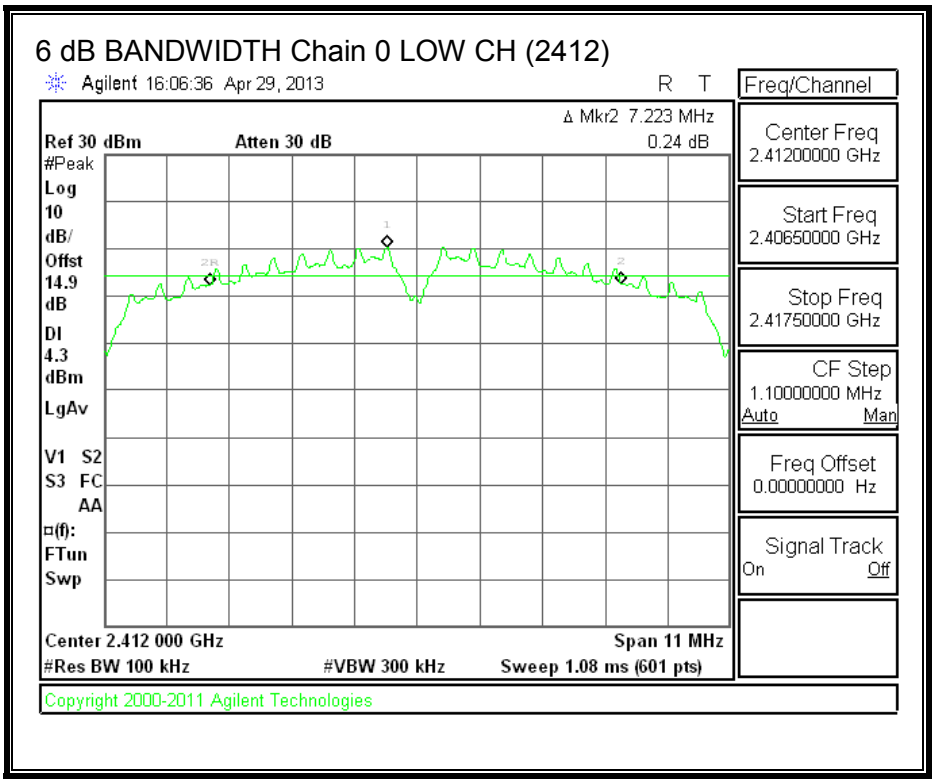
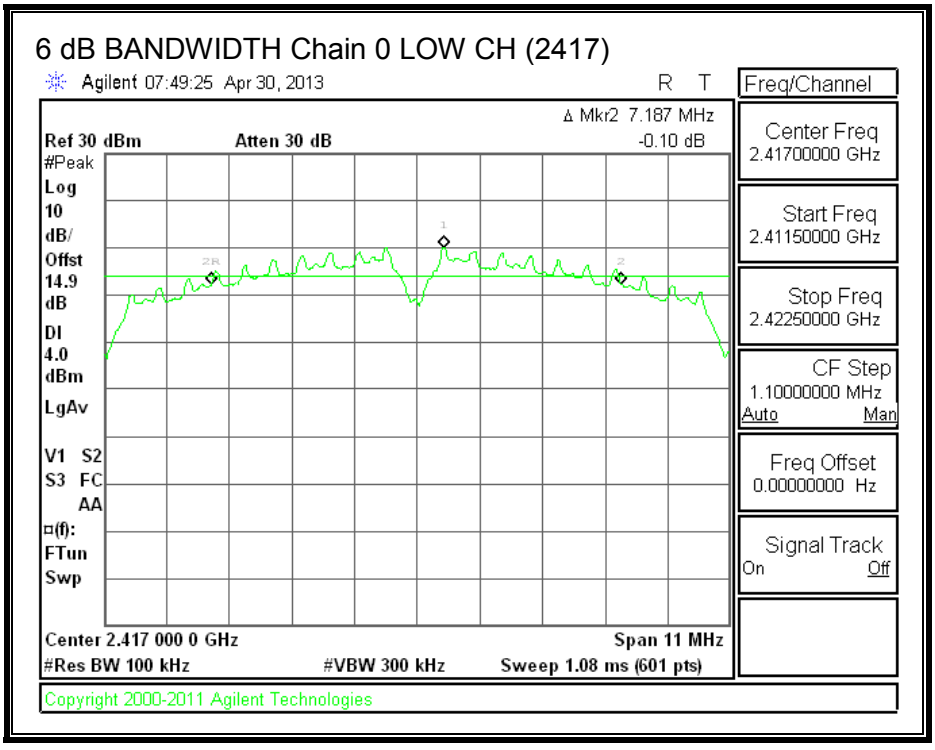
6 dB BANDWIDTH, Chain 0





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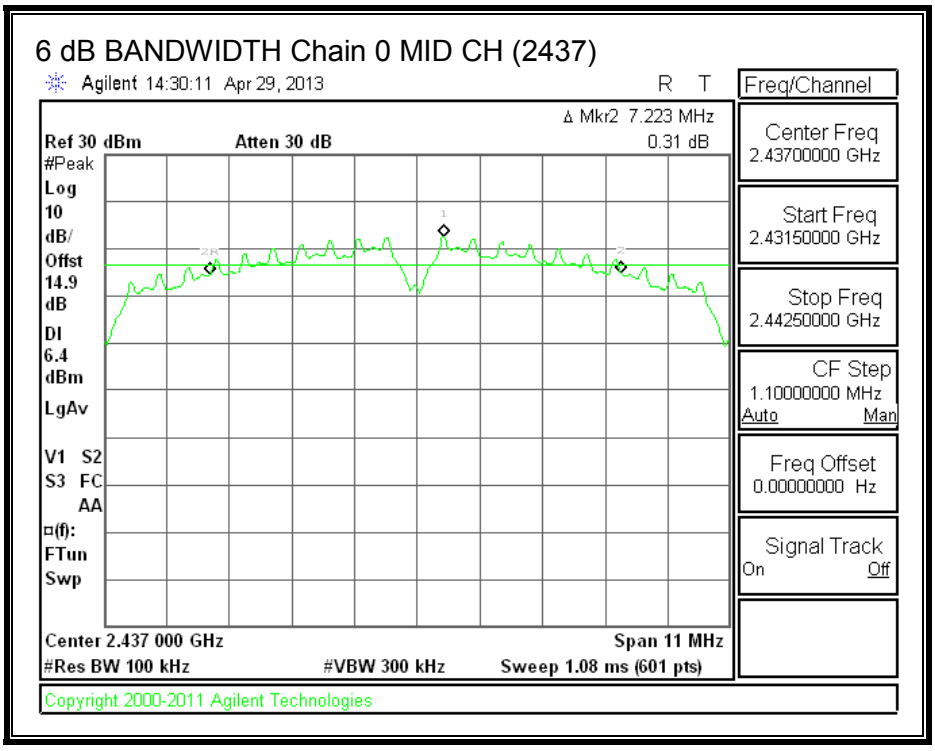

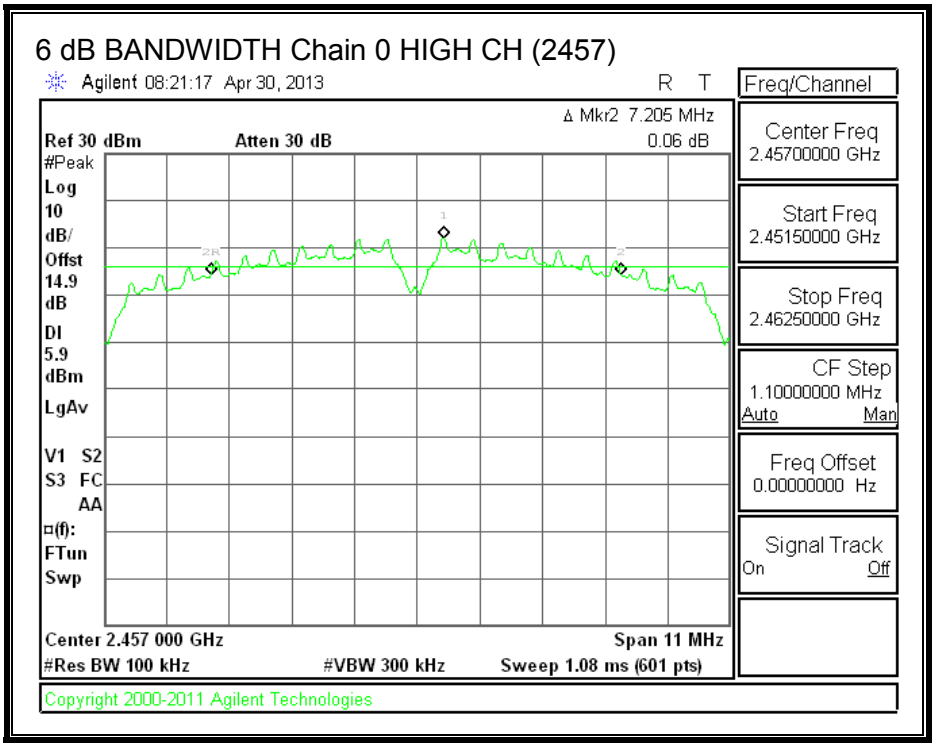

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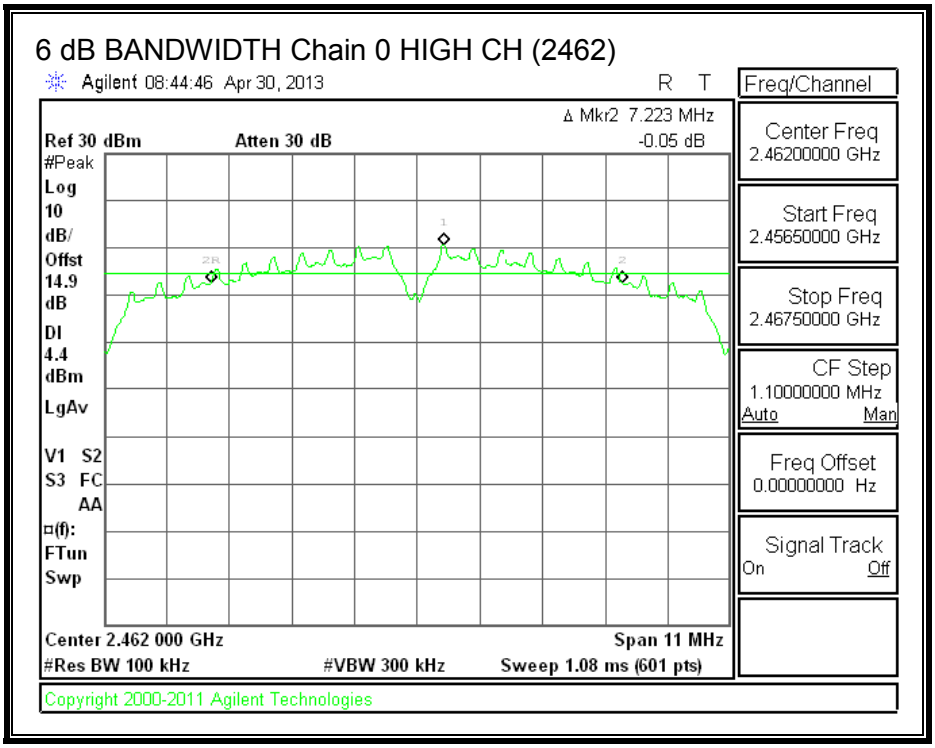
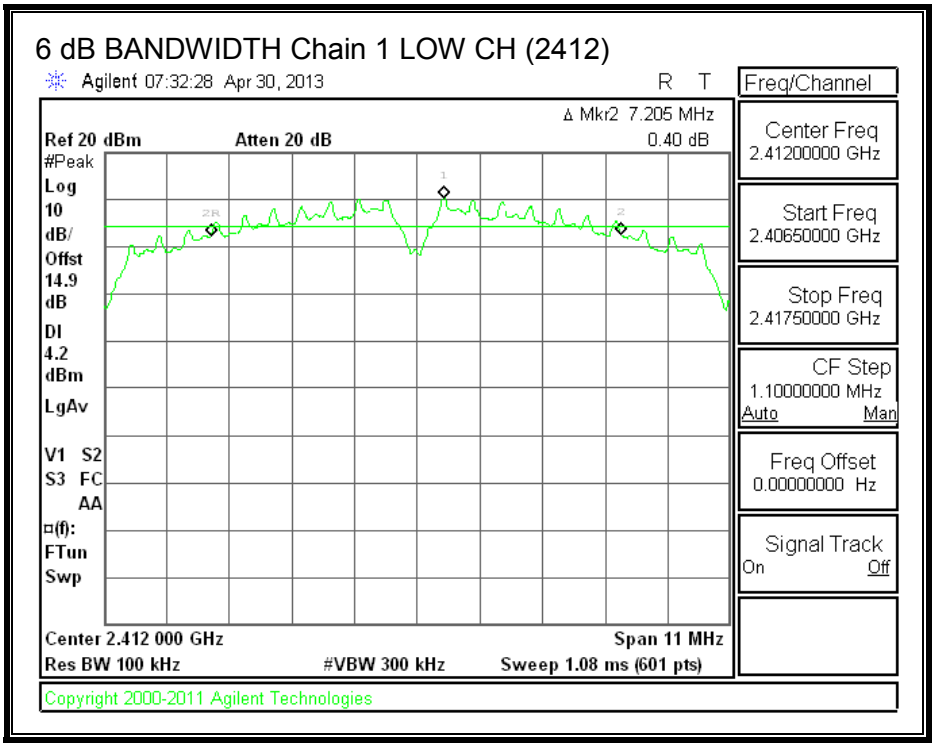


6 dB BANDWIDTH, Chain 1



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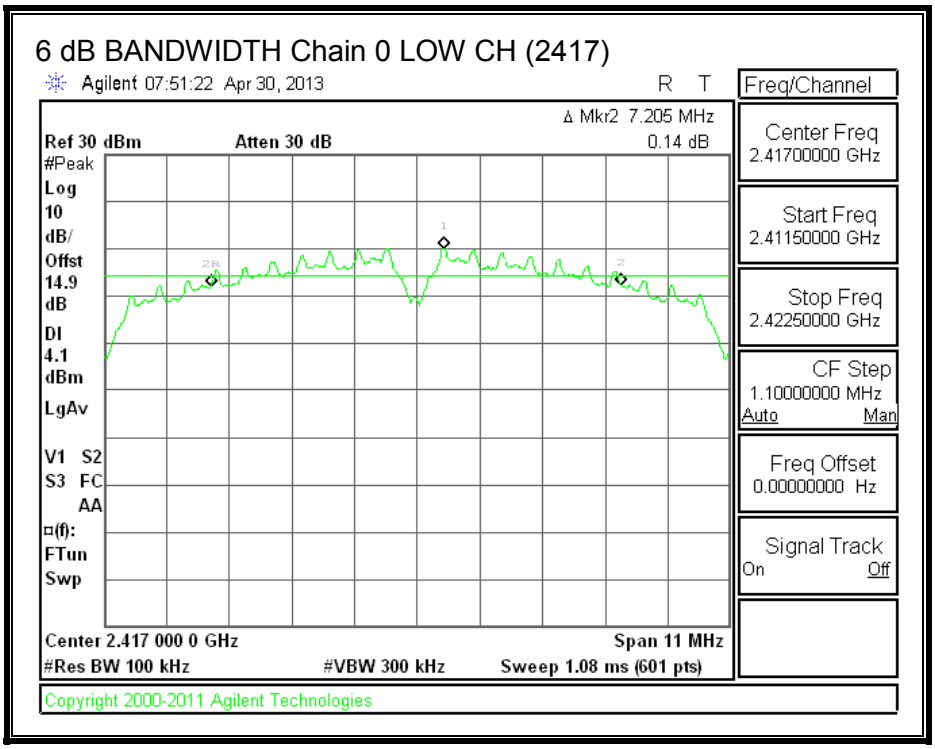

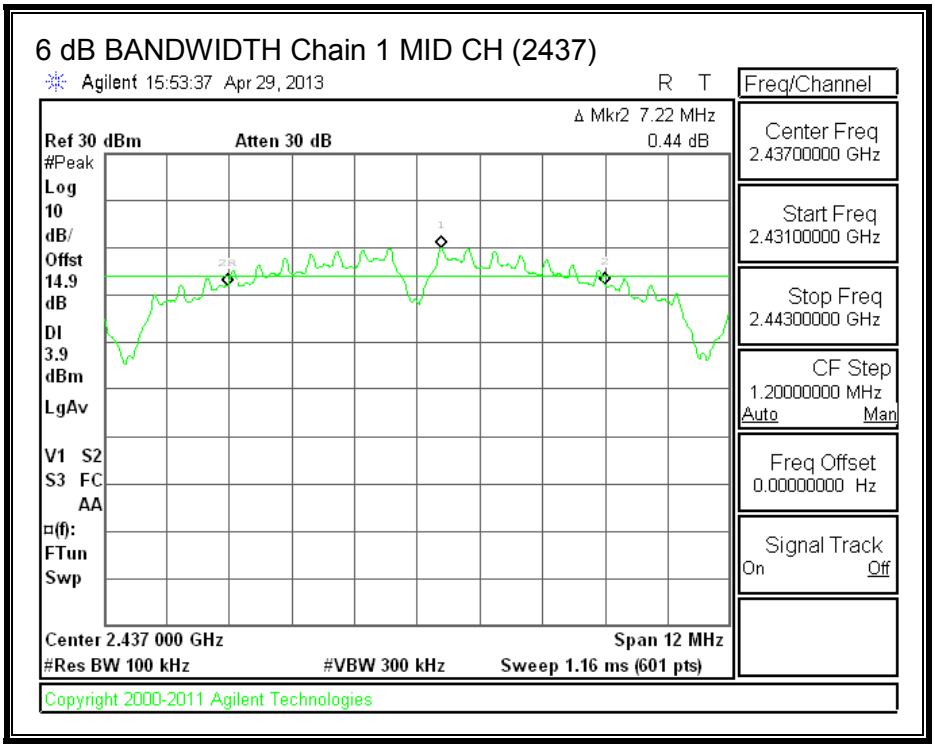

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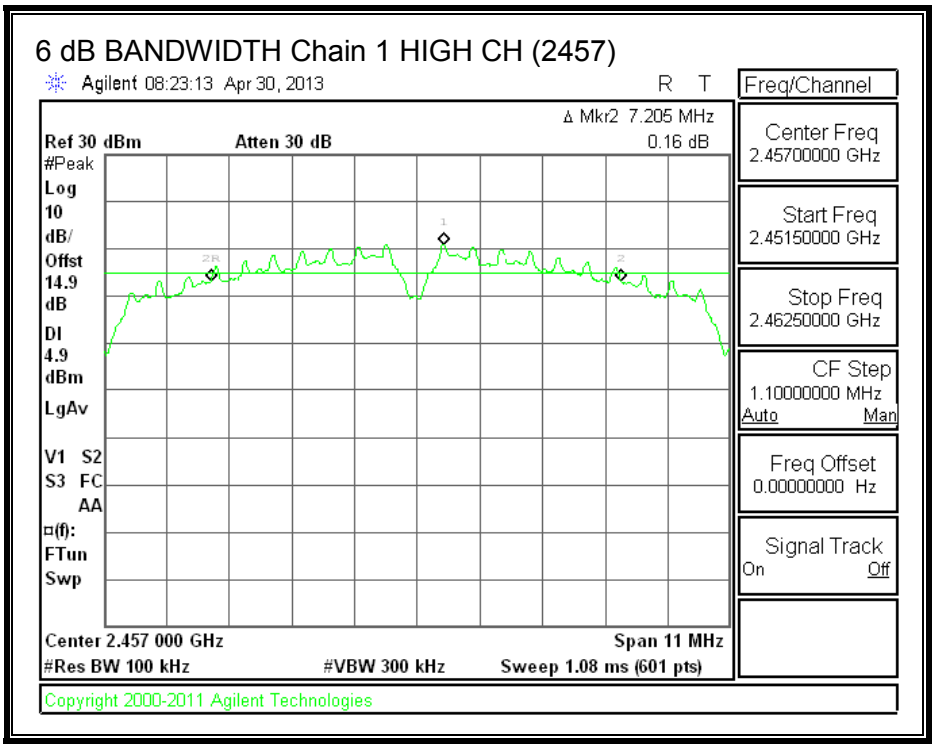

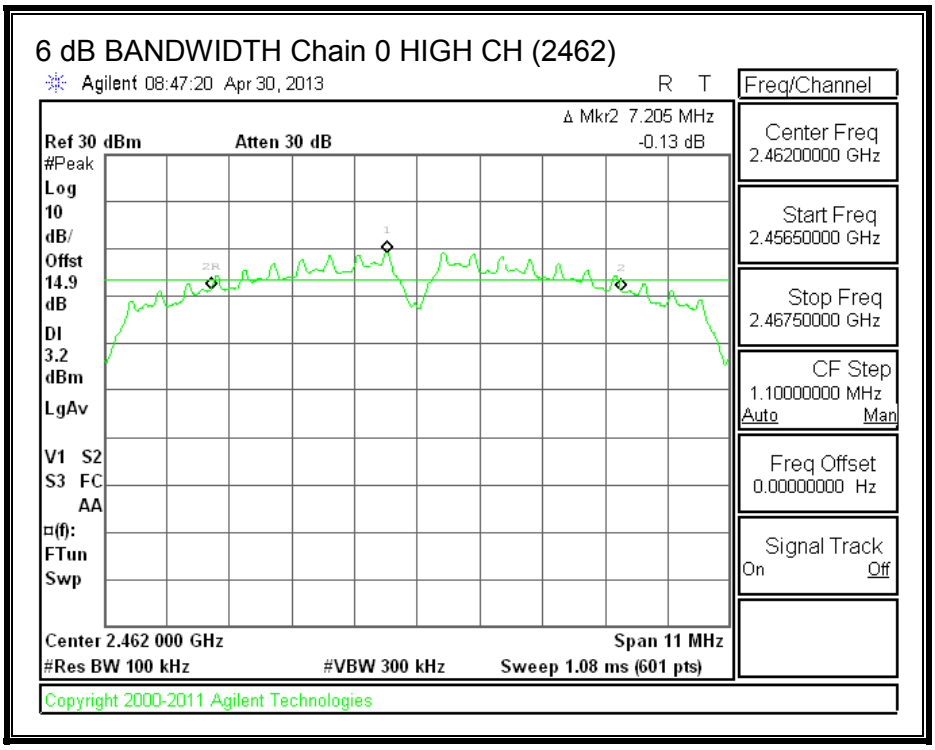

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8.1.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	2412	12.4602	12.3436
Low	2417	12.4462	12.2834
Mid	2437	12.4974	12.2287
High	2457	12.6931	12.3118
High	2462	12.3501	11.9920

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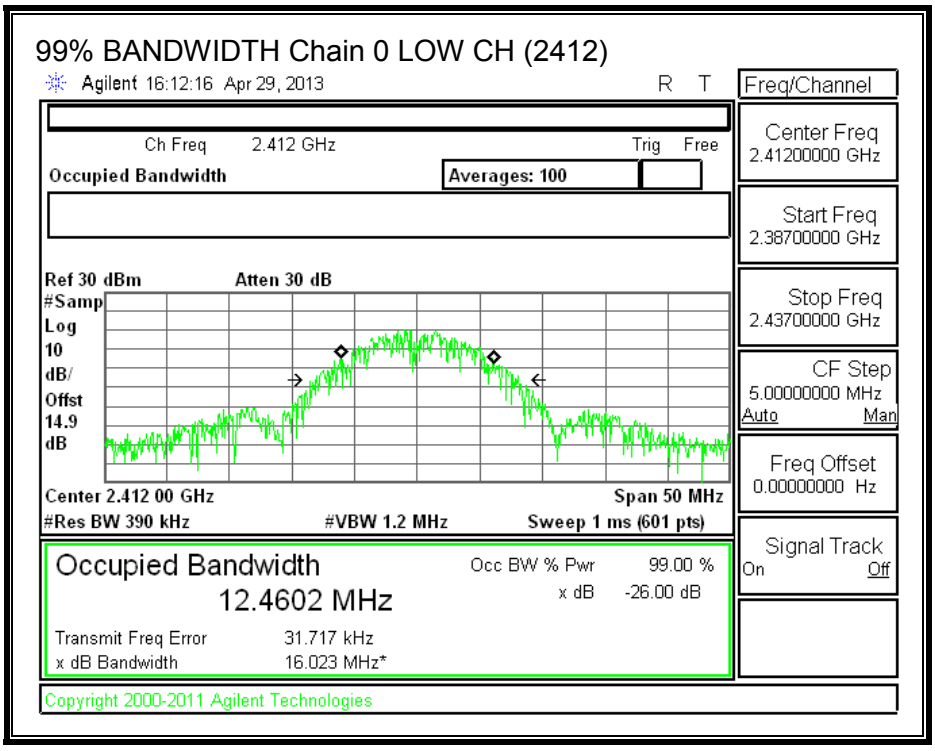
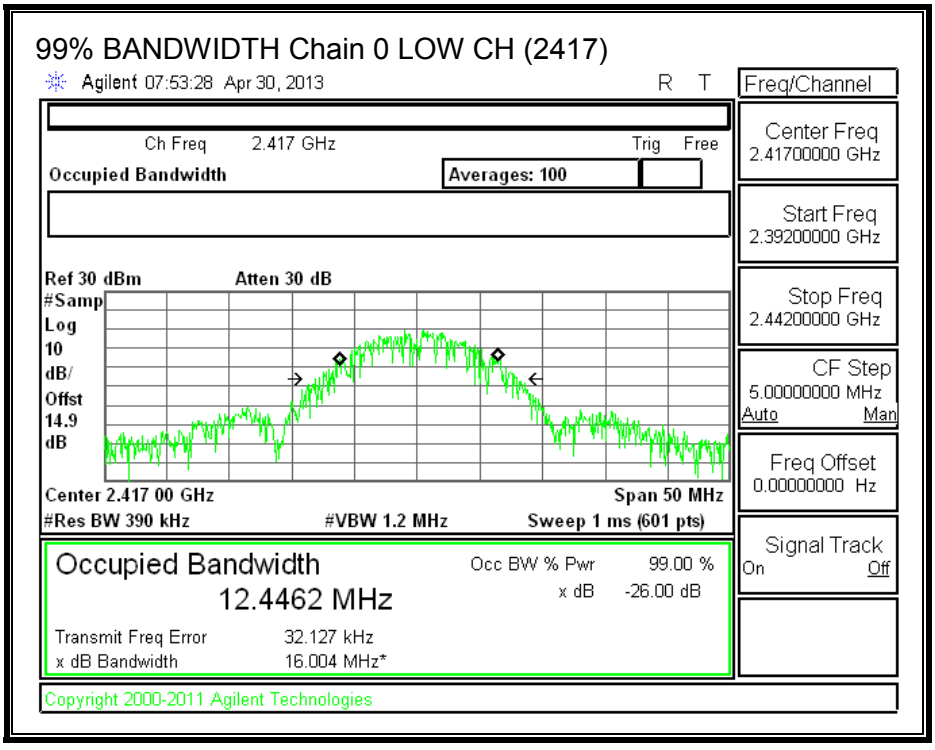
99% BANDWIDTH, Chain 0





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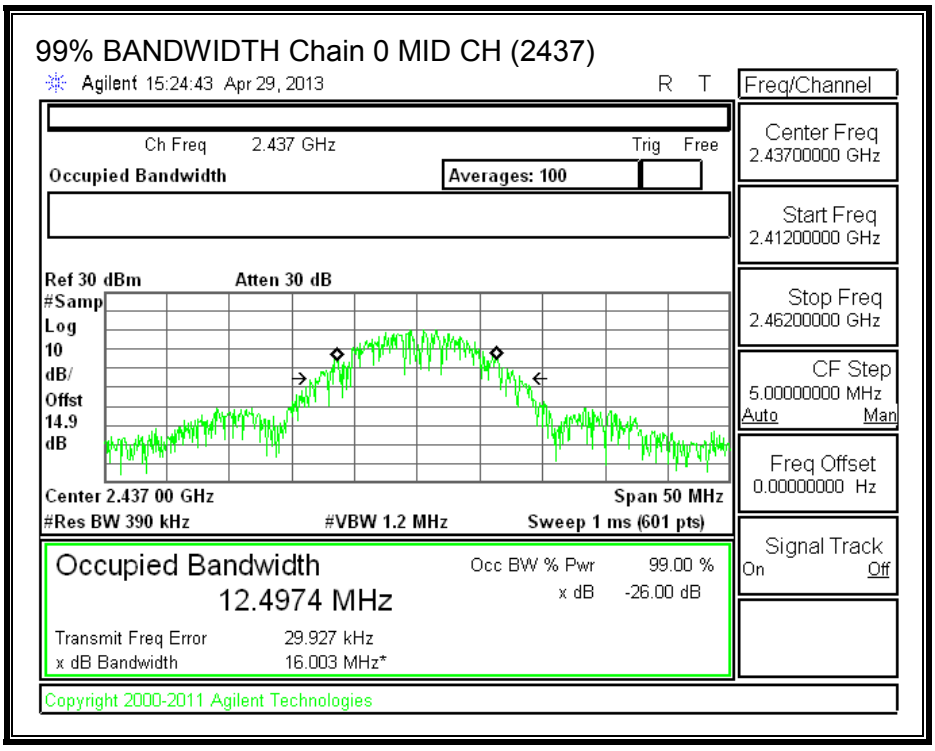

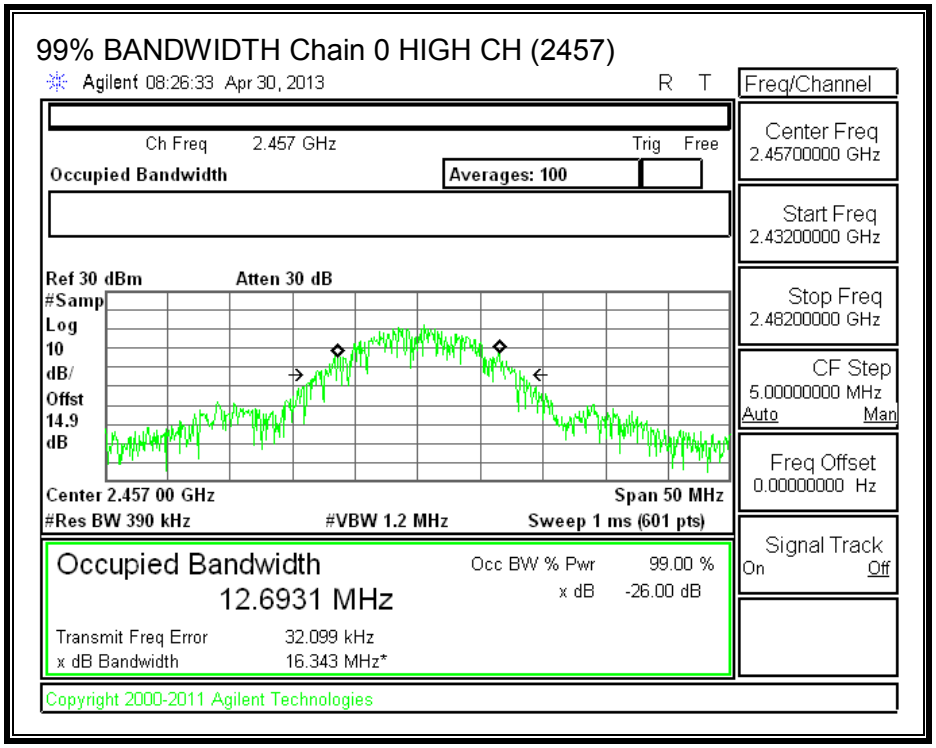

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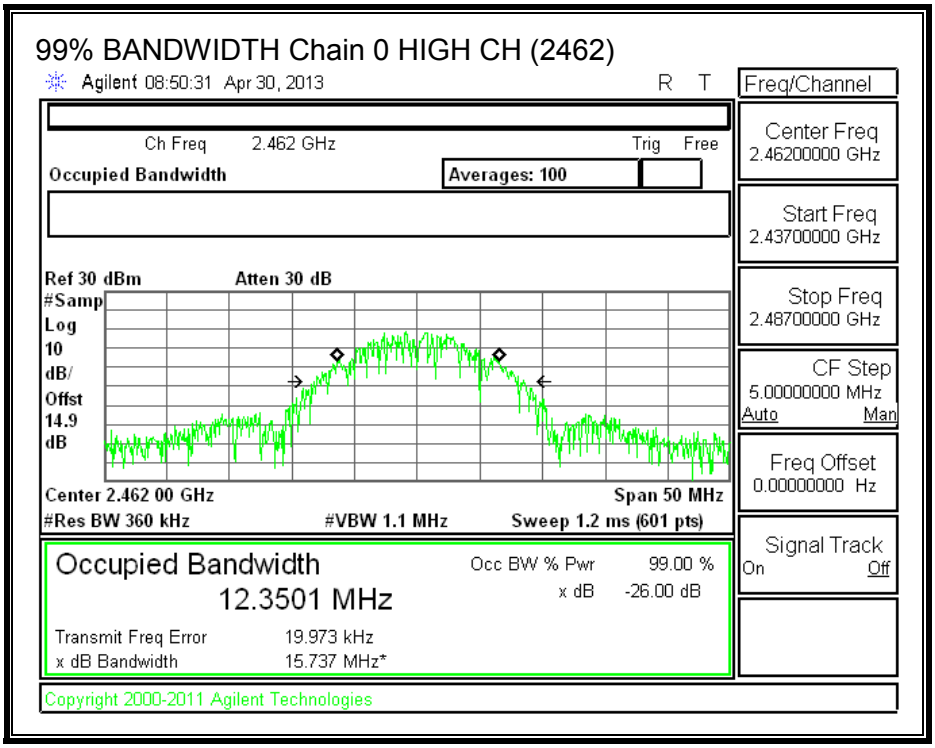
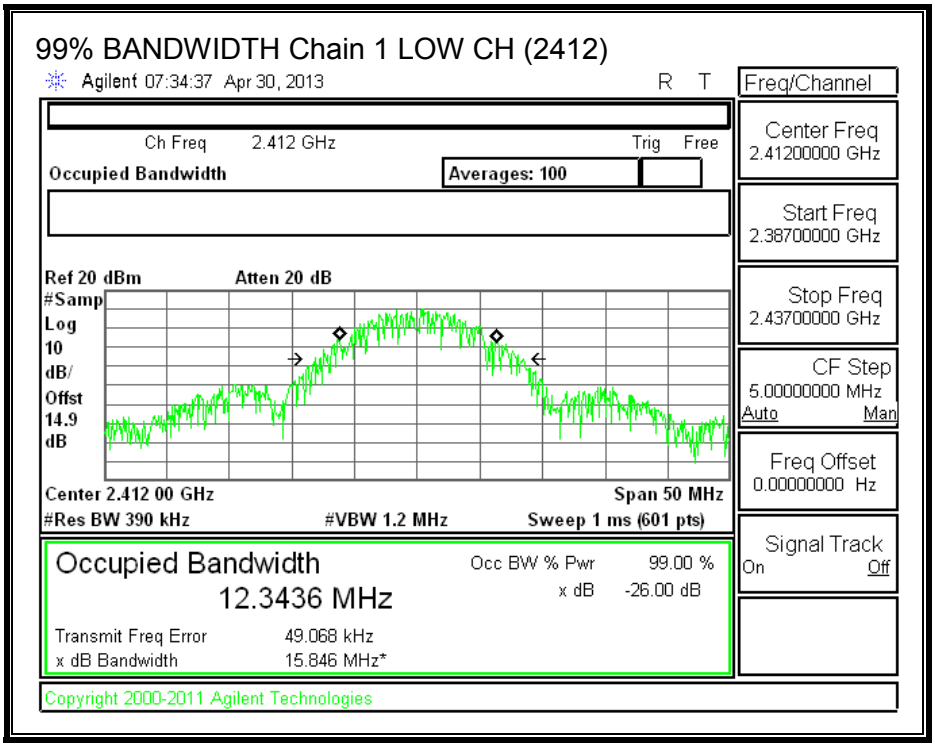


99% BANDWIDTH, Chain 1



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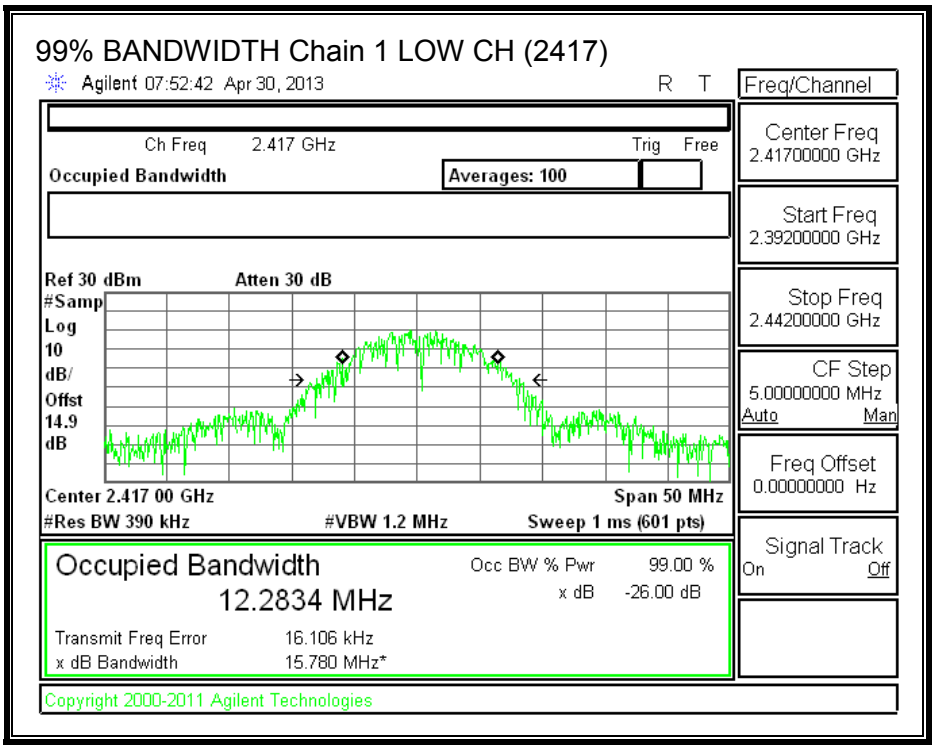

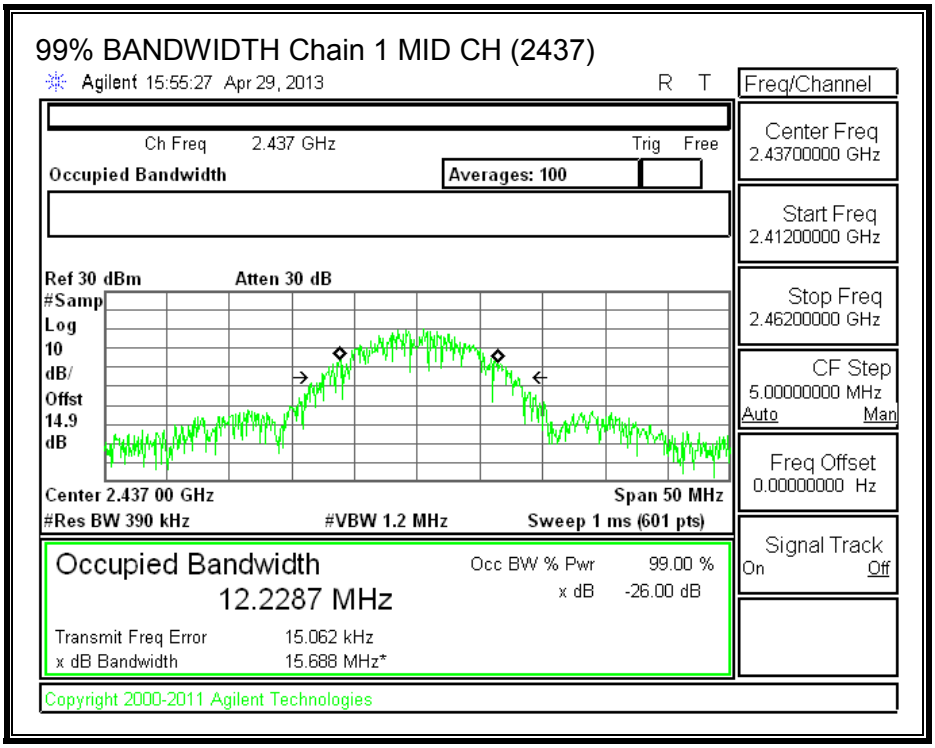

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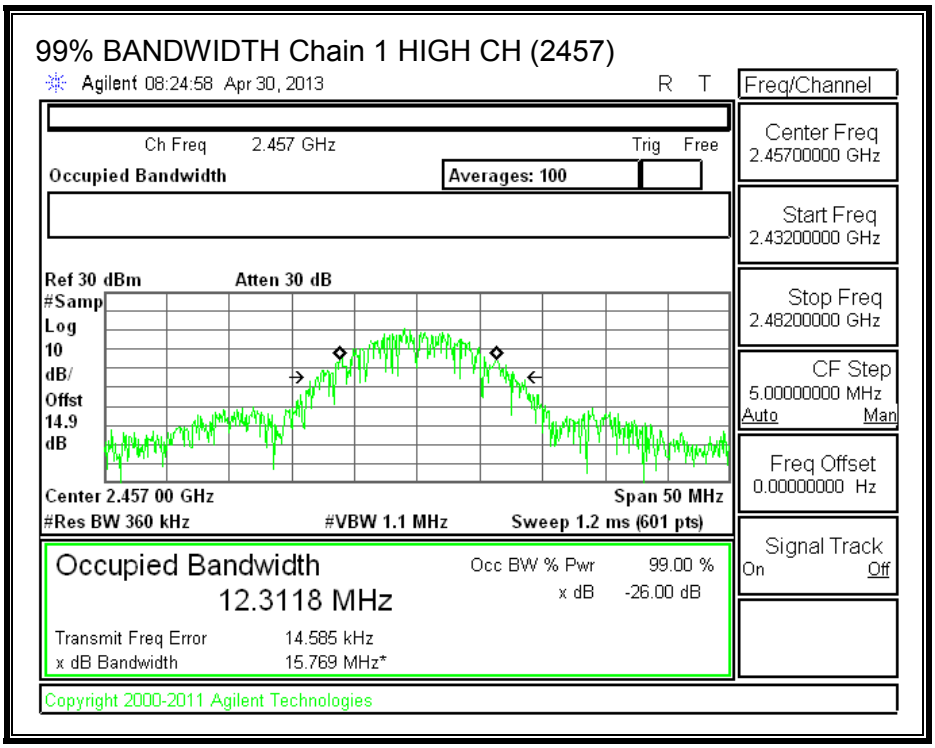

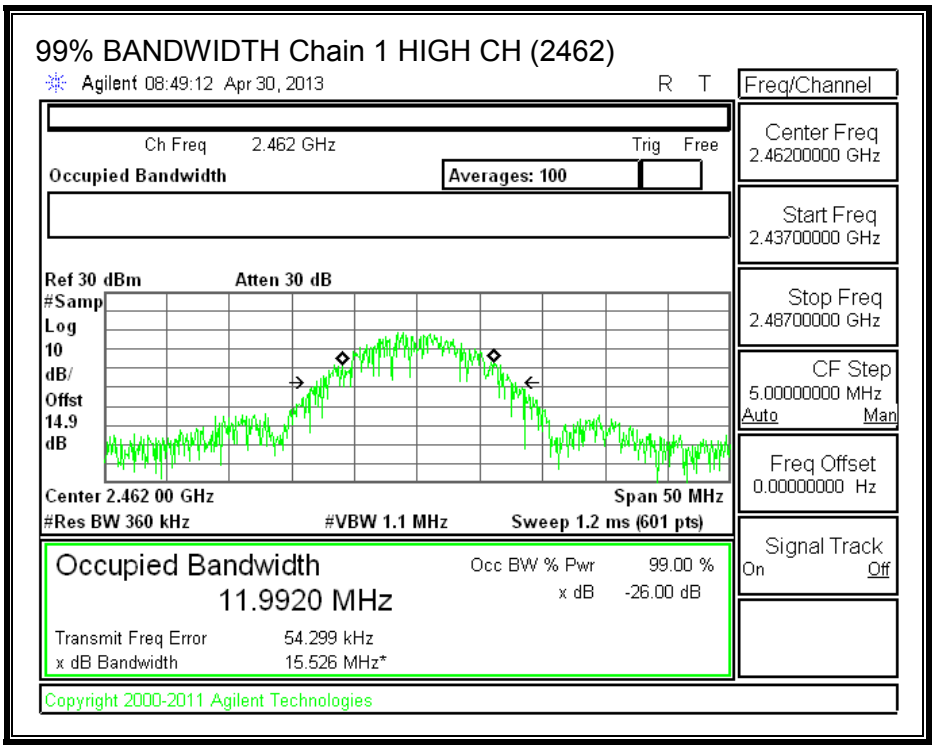

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8.1.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 14.88 dB (including 10 dB pad, power splitter 3.4 dB, and 1.48 cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	2412	17.80	17.60	20.71
Low	2417	18.00	18.10	21.06
Mid	2437	18.70	17.80	21.28
High	2457	17.70	16.70	20.24
High	2462	18.50	17.40	21.00

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8.1.4. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is the same for each chain. The directional gain is equal to the antenna gain.

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
2.00	2.00	2.00

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RESULTS

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	2.00	30.00	30	36	30.00
Low	2417	2.00	30.00	30	36	30.00
Mid	2437	2.00	30.00	30	36	30.00
High	2457	2.00	30.00	30	36	30.00
High	2462	2.00	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	20.05	20.21	23.14	30.00	-6.86
Low	2417	19.71	19.84	22.79	30.00	-7.21
Mid	2437	20.67	19.62	23.19	30.00	-6.81
High	2457	20.35	19.40	22.91	30.00	-7.09
High	2462	20.08	18.92	22.55	30.00	-7.45

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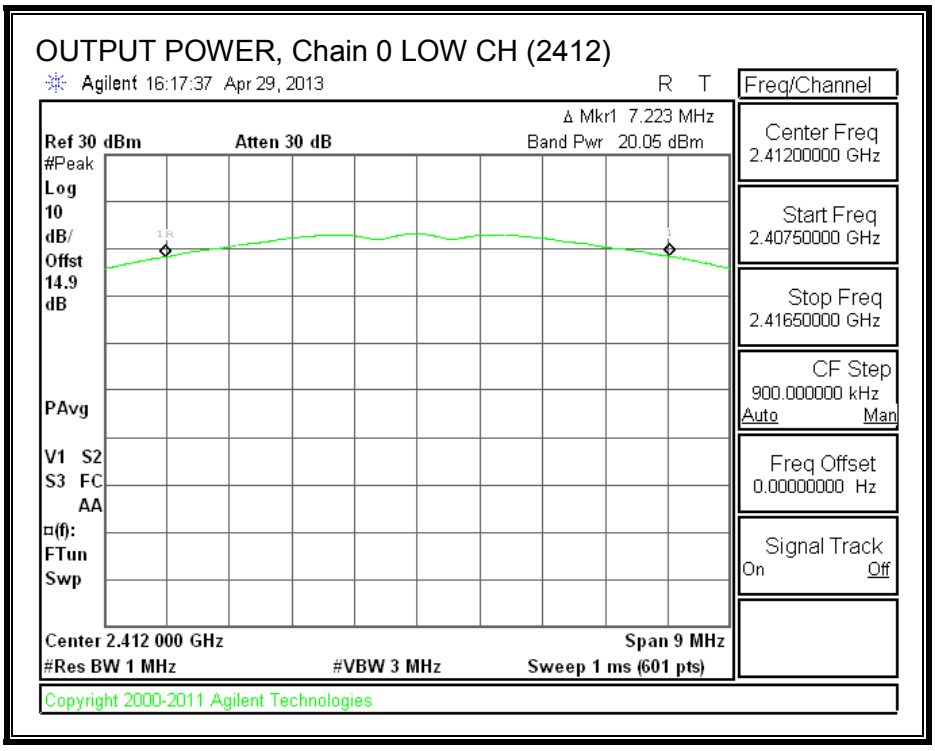
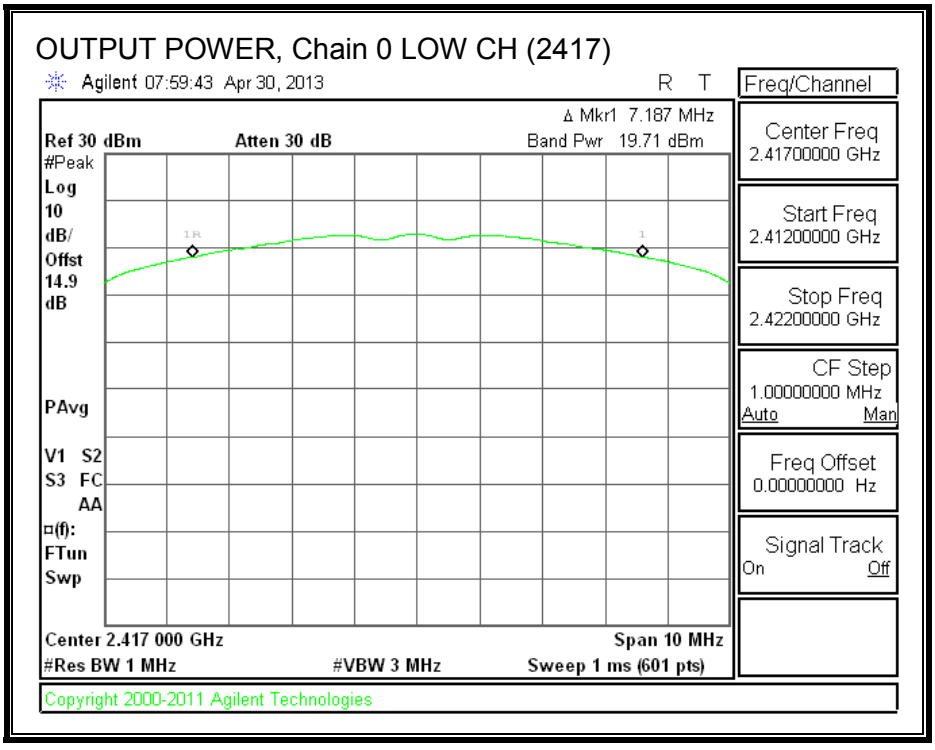
OUTPUT POWER, Chain 0





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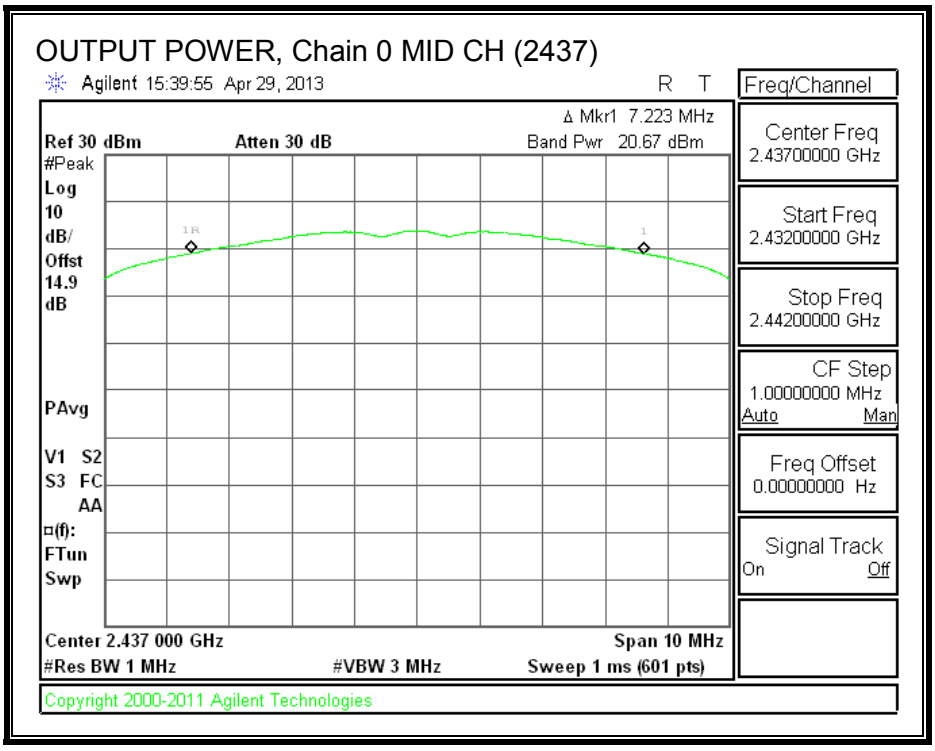
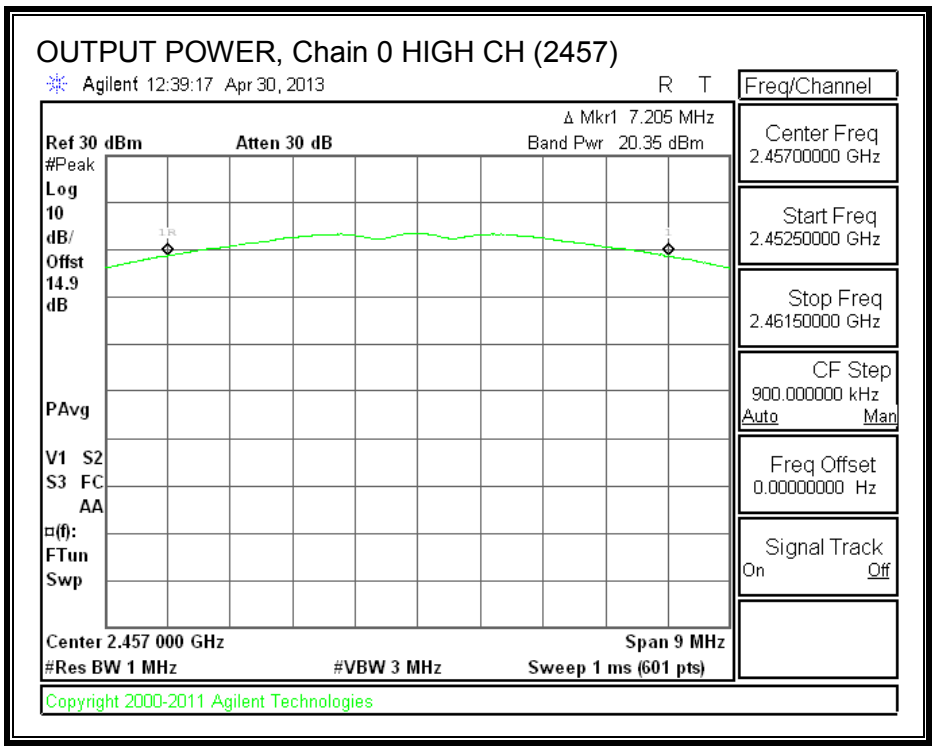
OUTPUT POWER, Chain 0 MID CH (2437)



OUTPUT POWER, Chain 0 HIGH CH (2457)



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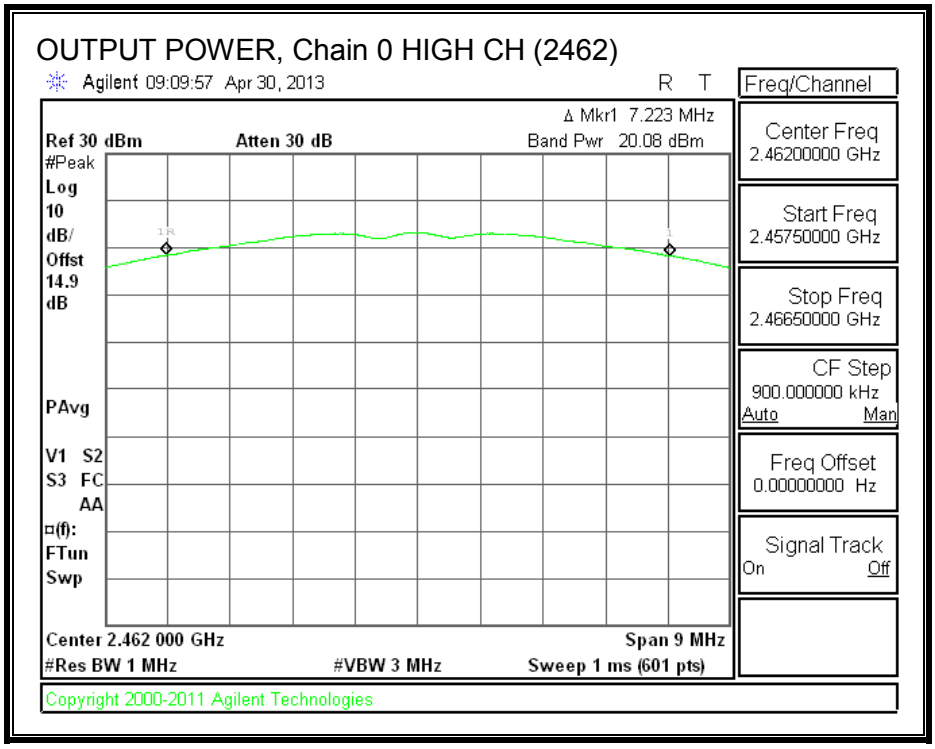
OUTPUT POWER, Chain 0 HIGH CH (2462)



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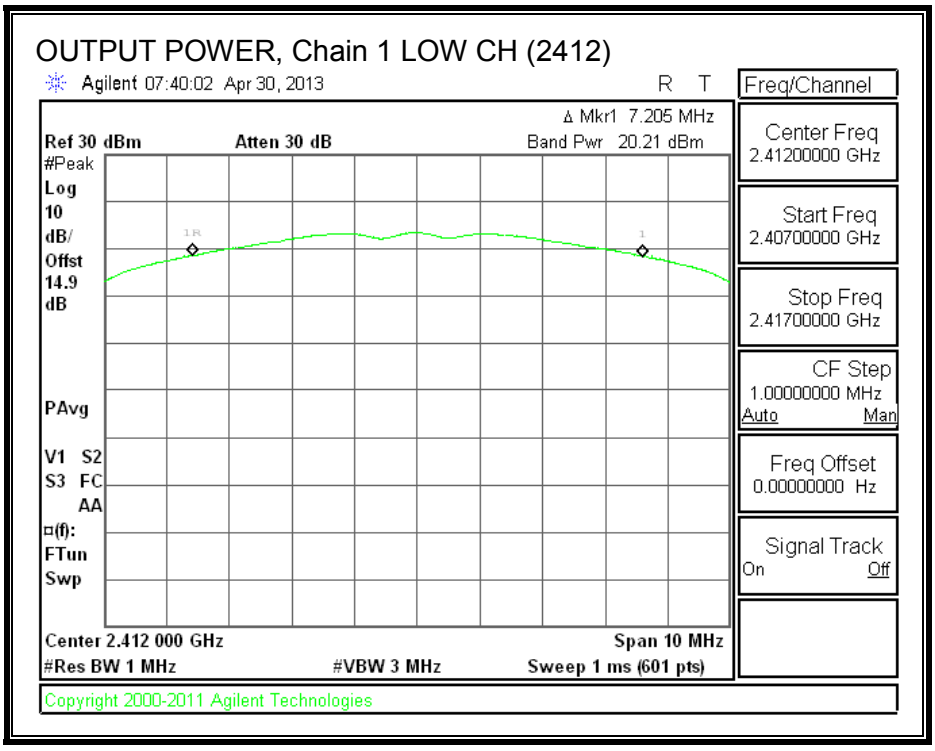
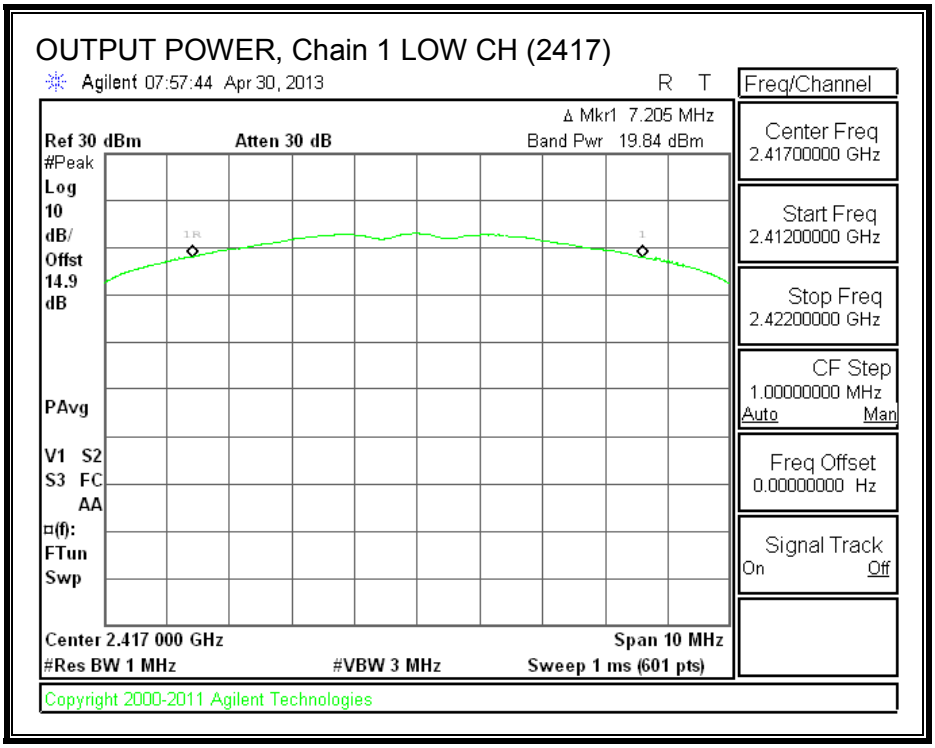
OUTPUT POWER, Chain 1





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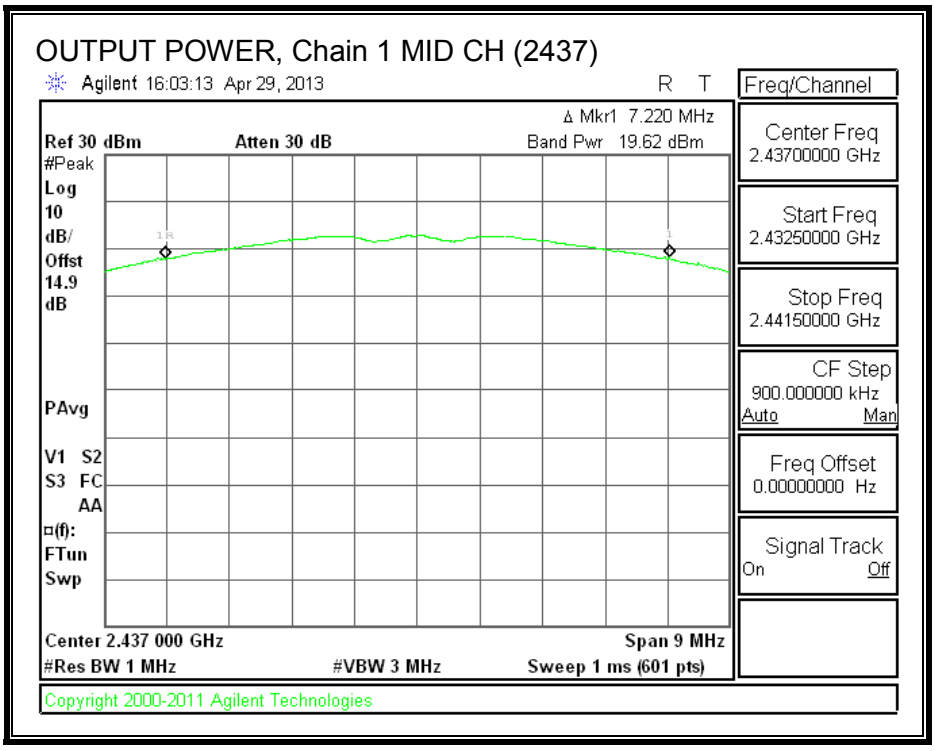
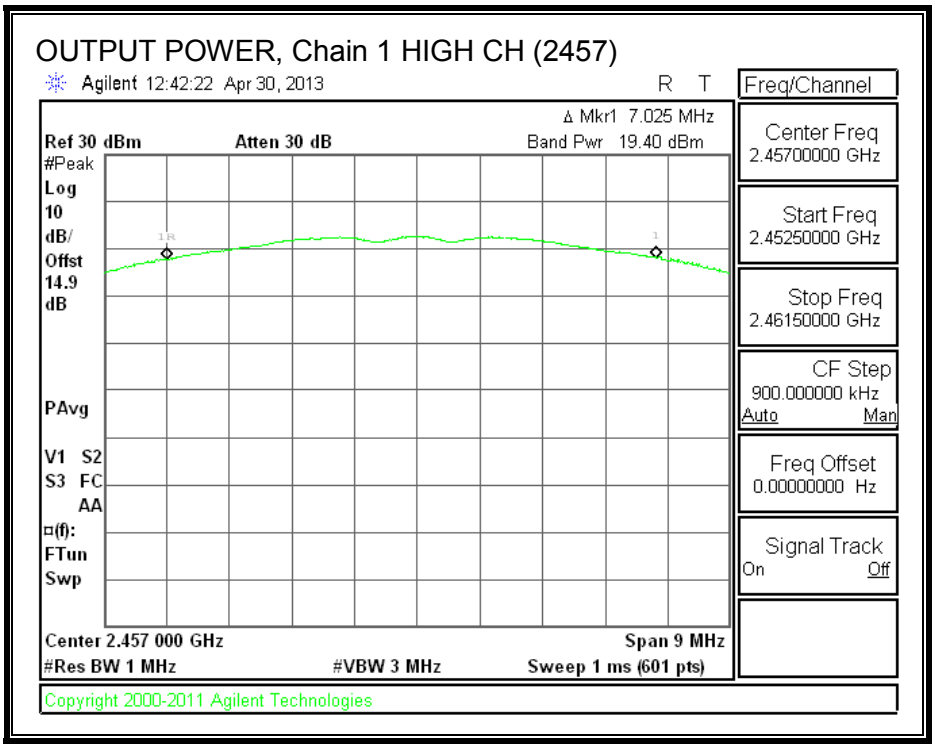
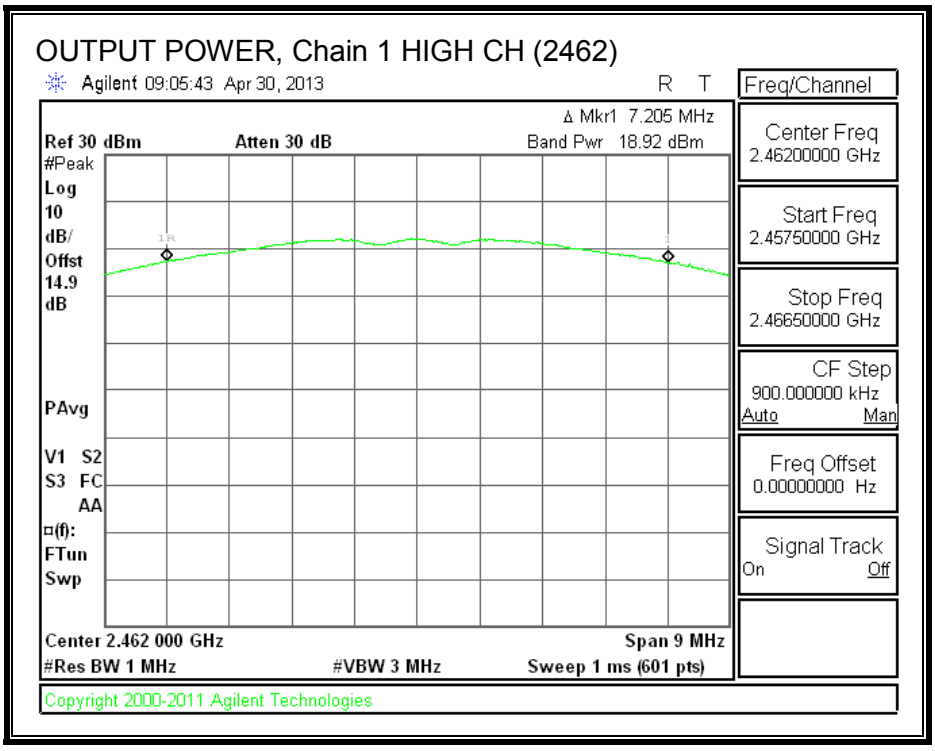
OUTPUT POWER, Chain 1 MID CH (2437)



OUTPUT POWER, Chain 1 HIGH CH (2457)



This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



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8.1.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247

IC RSS-210 A8.2

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Chain 1 Meas (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-3.42	-3.31	-0.35	8.0	-8.4
Low	2417	-4.03	-3.63	-0.82	8.0	-8.8
Mid	2437	-2.84	-3.85	-0.31	8.0	-8.3
High	2457	-2.88	-4.00	-0.39	8.0	-8.4
High	2462	-3.38	-4.66	-0.96	8.0	-9.0

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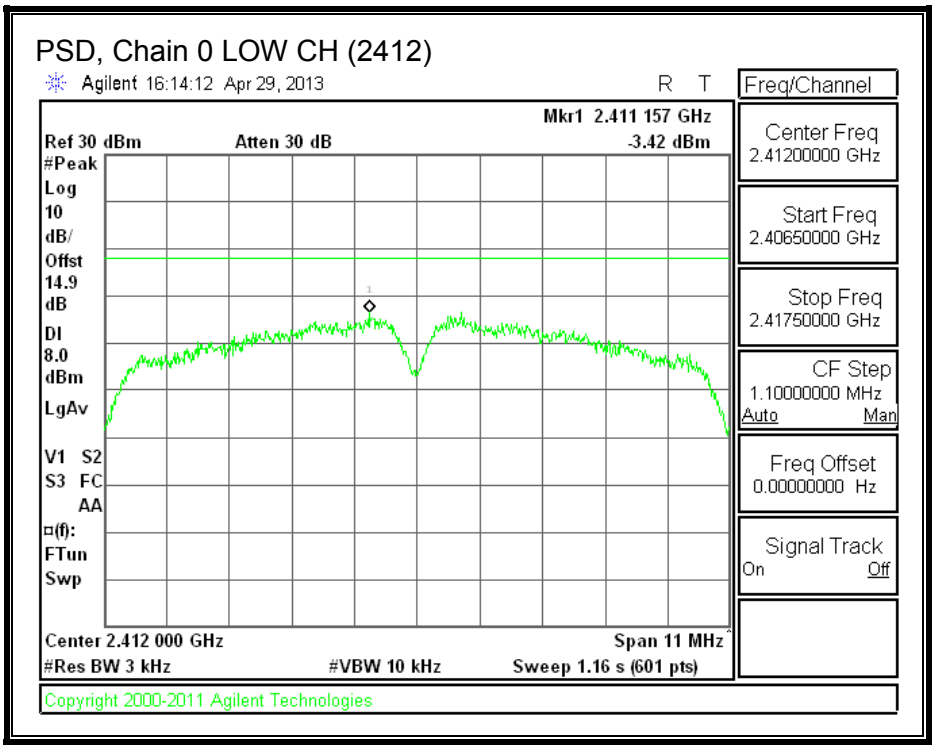
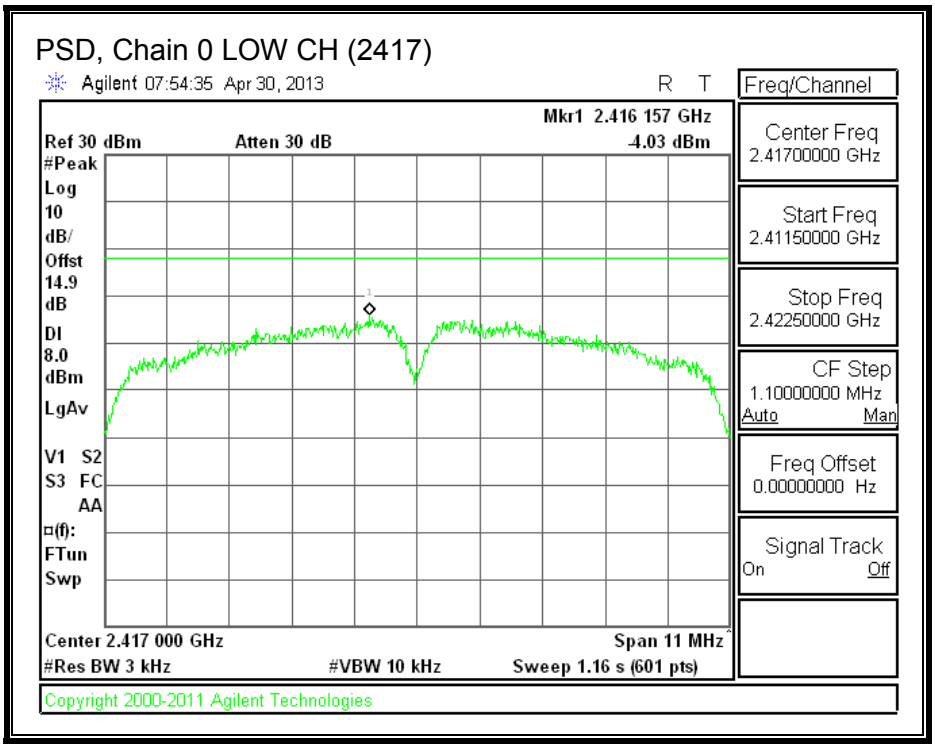
PSD, Chain 0





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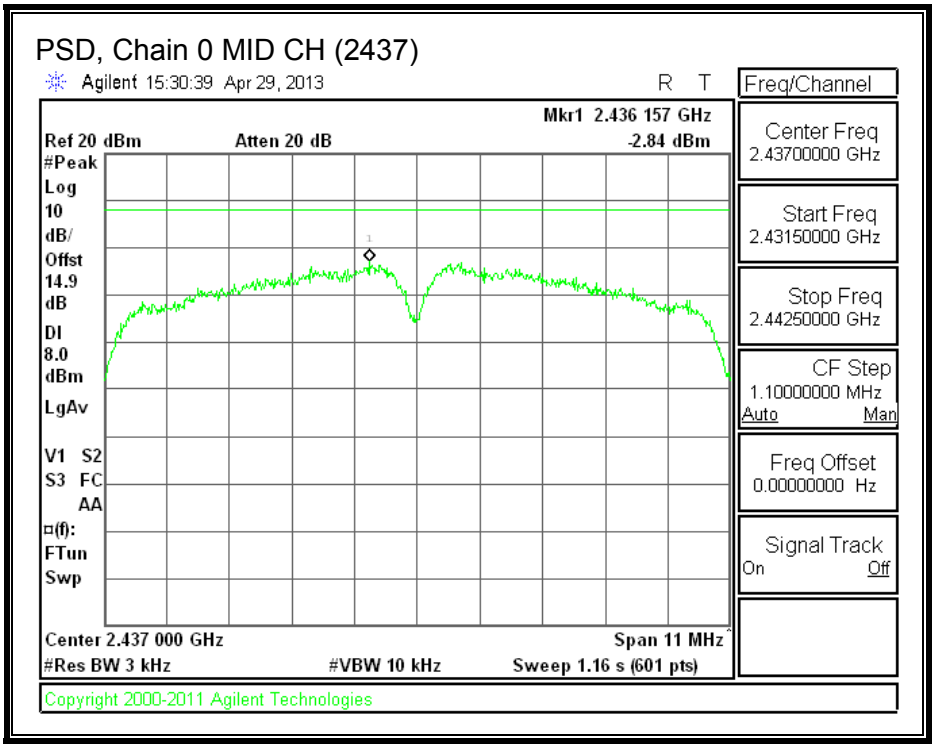
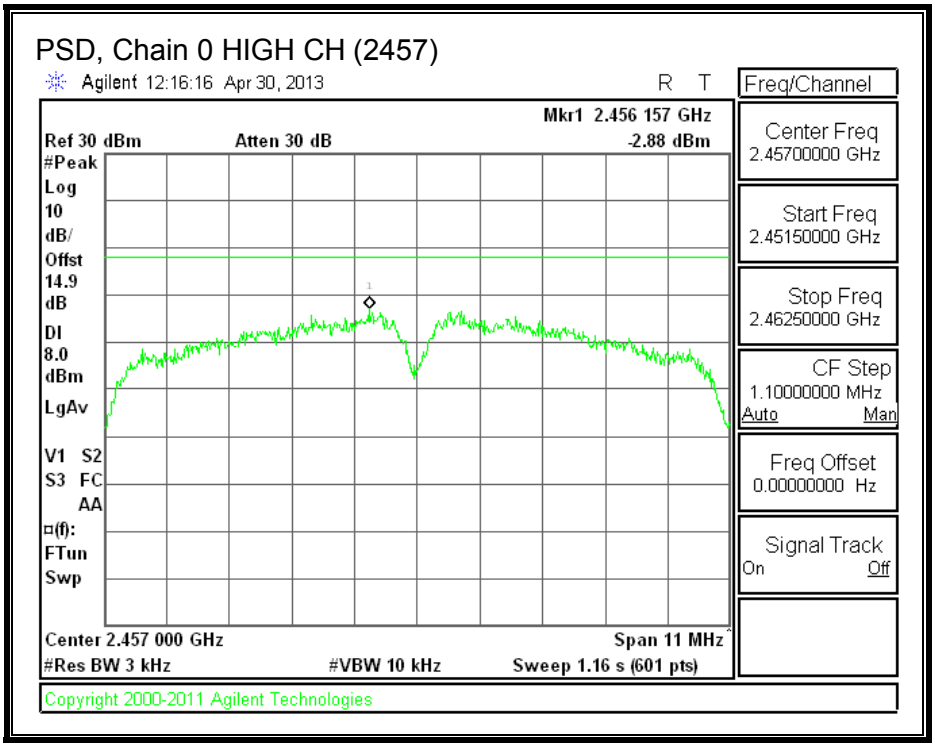
PSD, Chain 0 MID CH (2437)



PSD, Chain 0 HIGH CH (2457)



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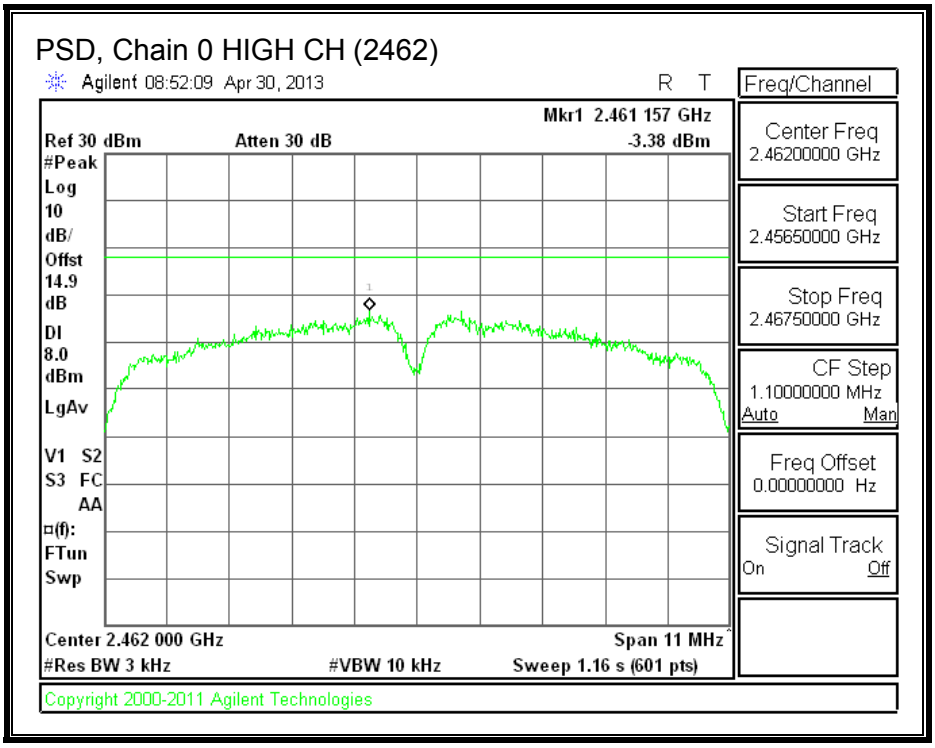
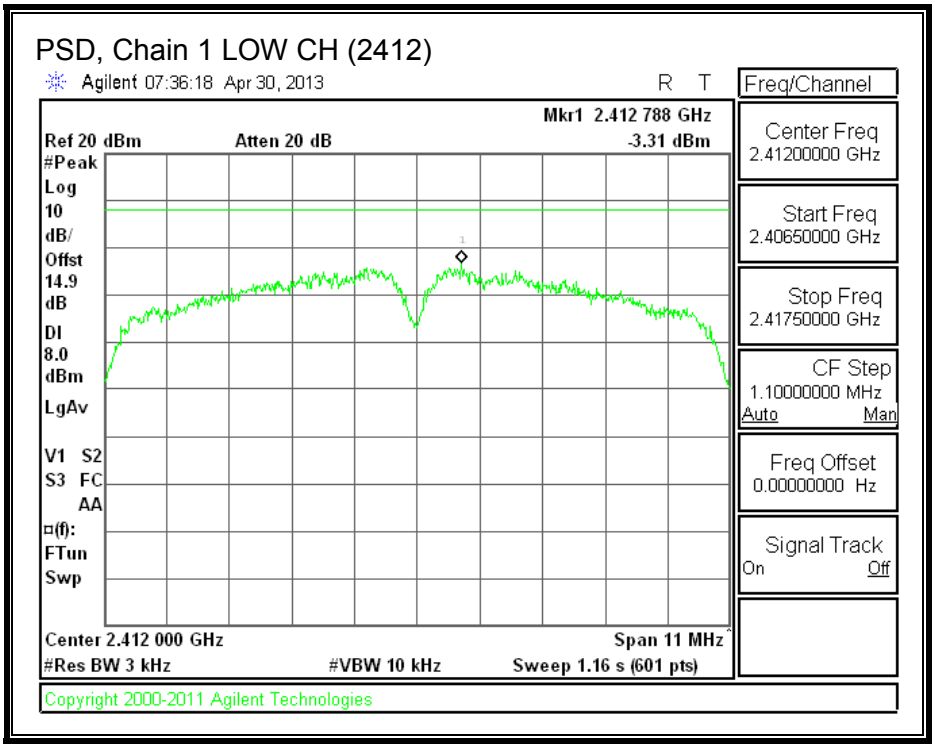


PSD, Chain 1



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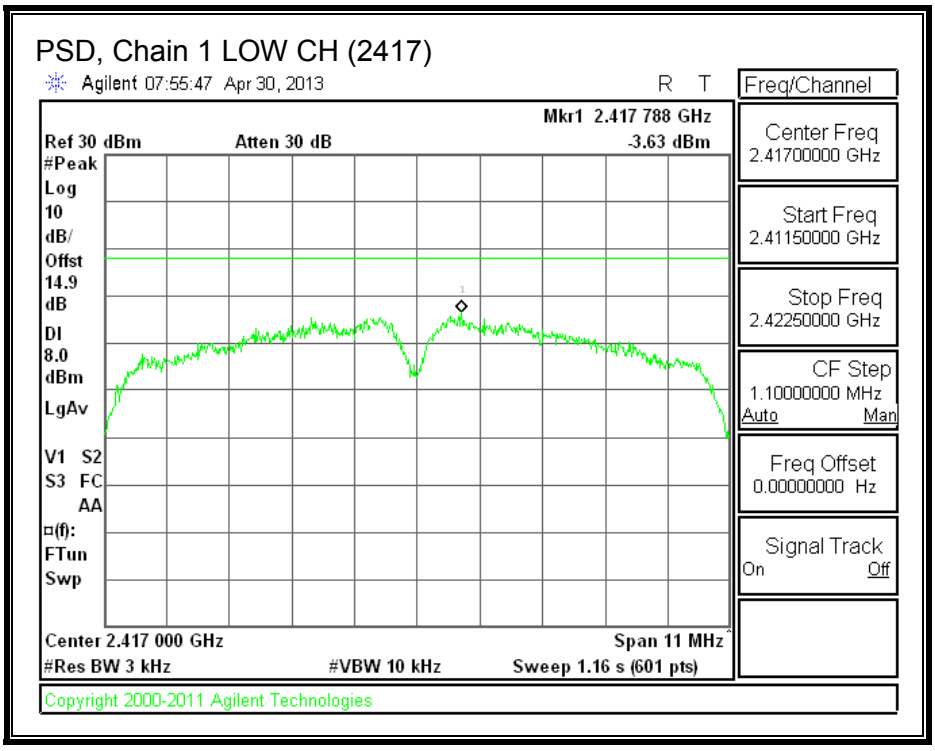
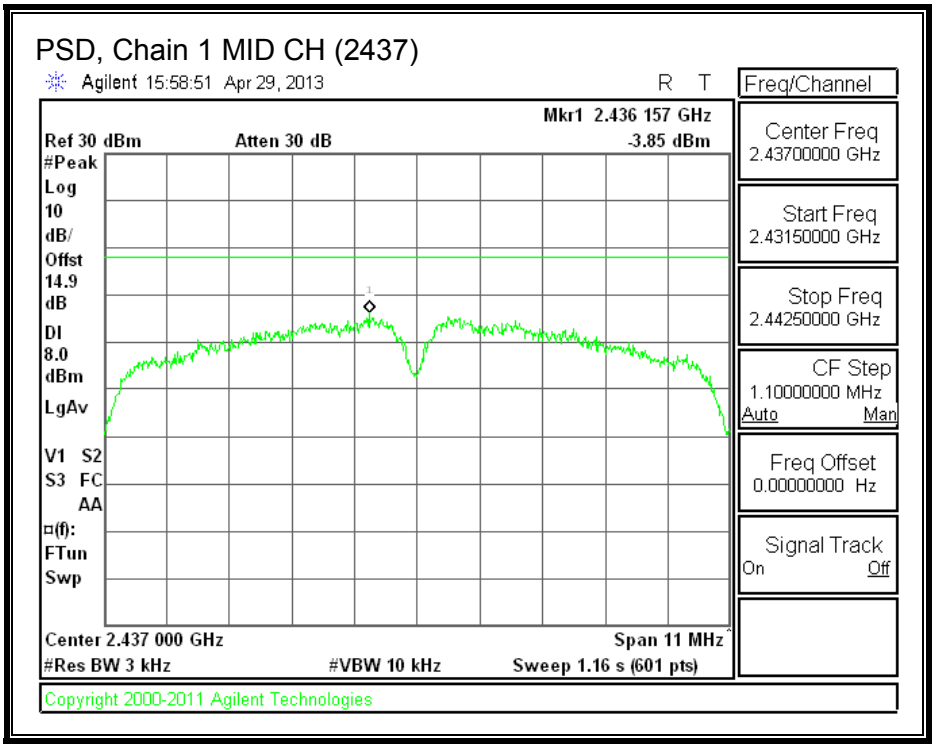
PSD, Chain 1 LOW CH (2417)



PSD, Chain 1 MID CH (2437)



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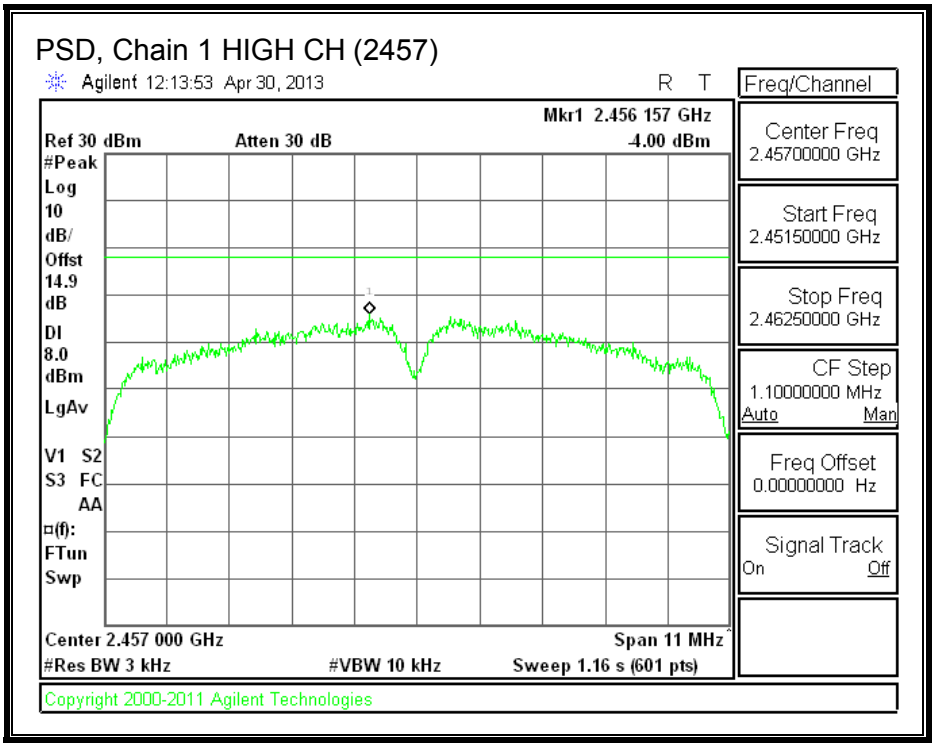
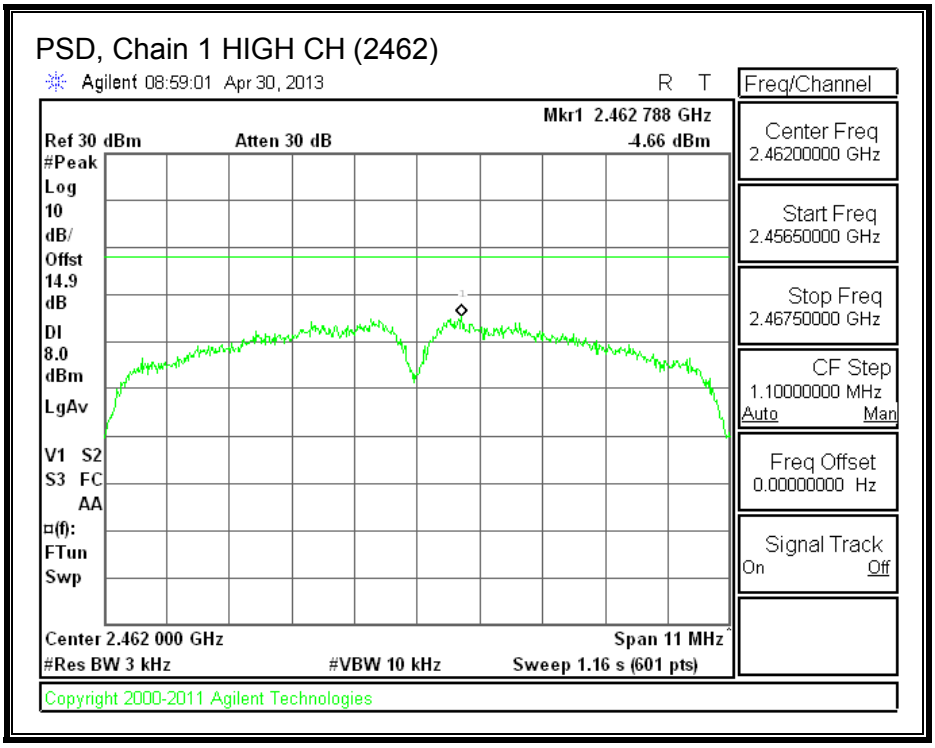
PSD, Chain 1 HIGH CH (2457)



PSD, Chain 1 HIGH CH (2462)



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8.1.6. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

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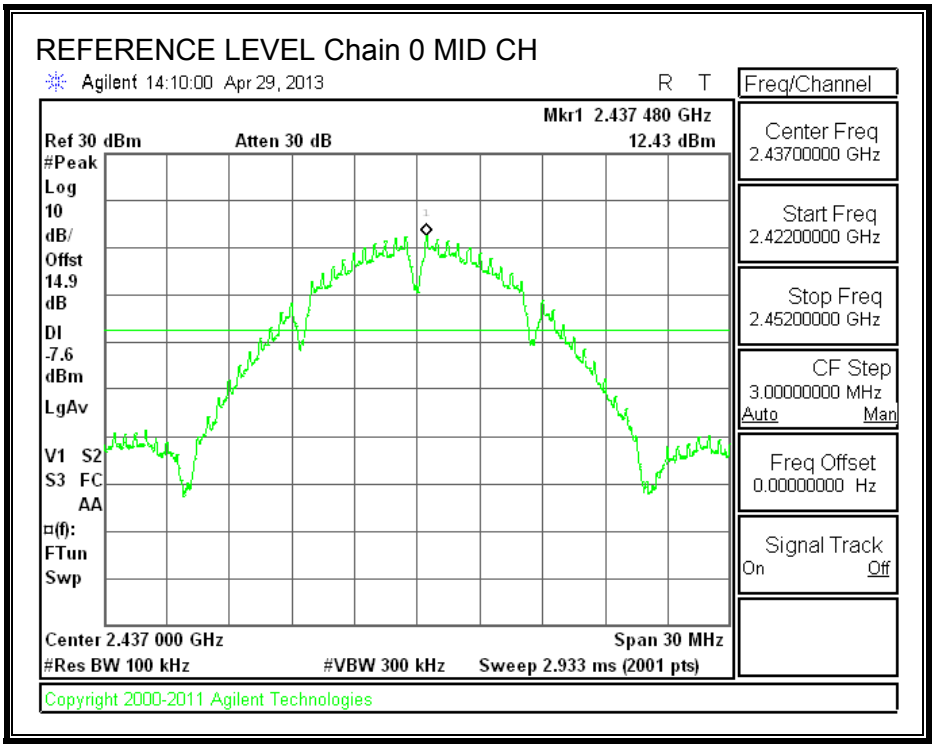
RESULTS

IN-BAND REFERENCE LEVEL, Chain 0



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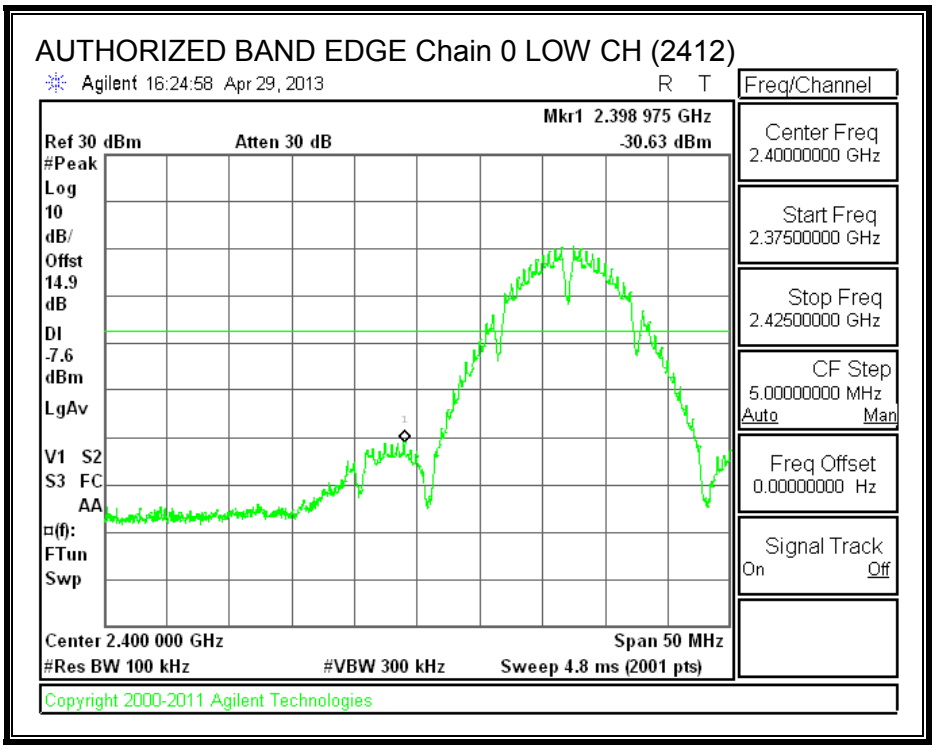
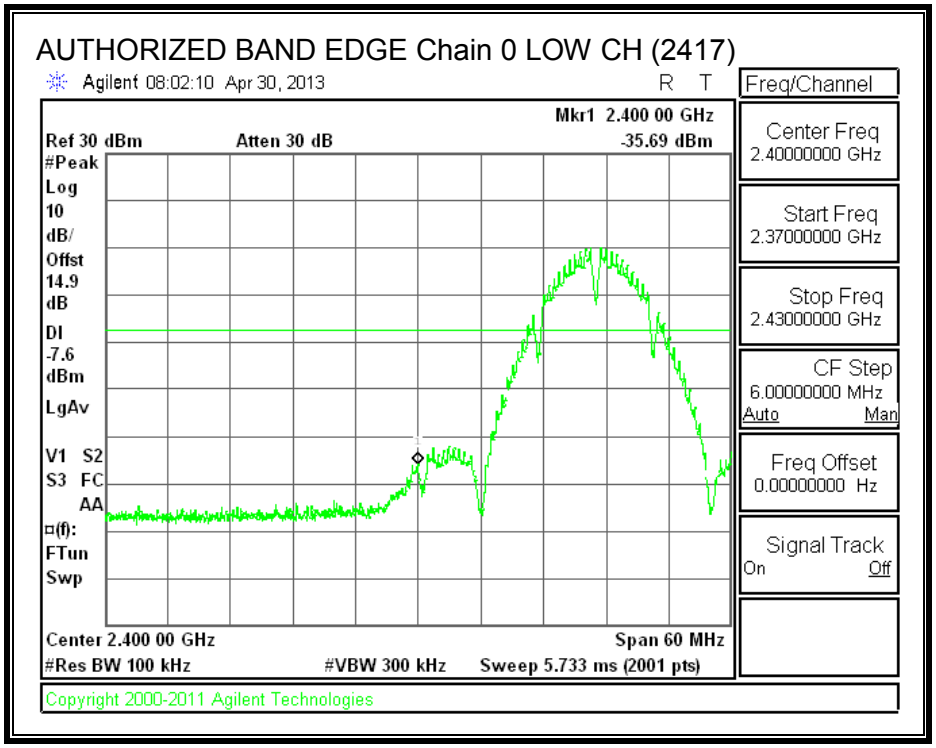
LOW CHANNEL BANDEDGE, Chain 0





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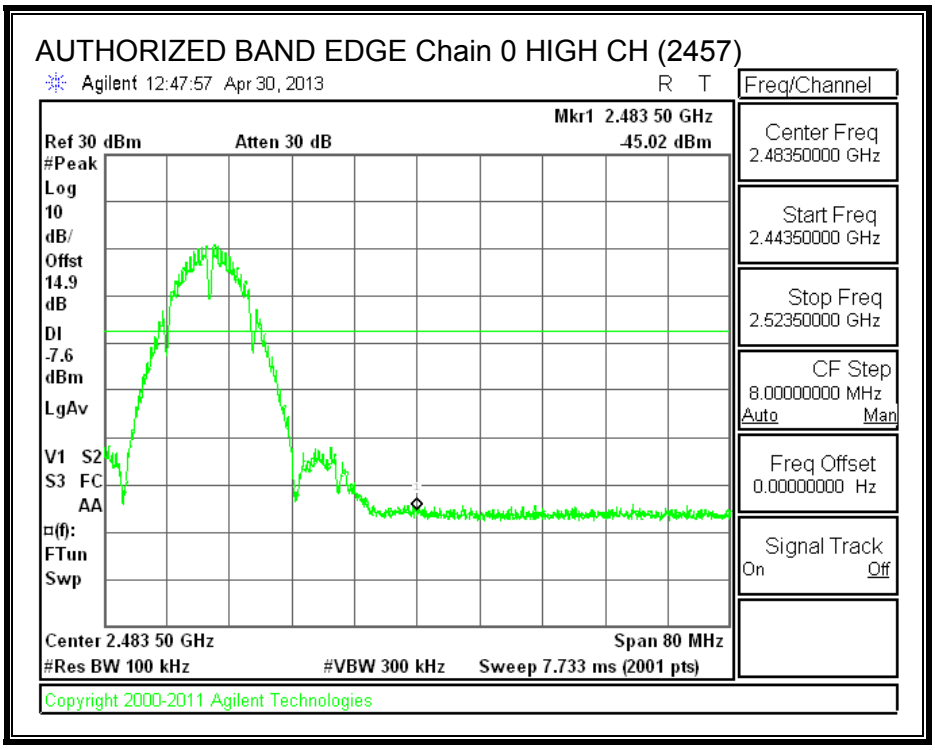
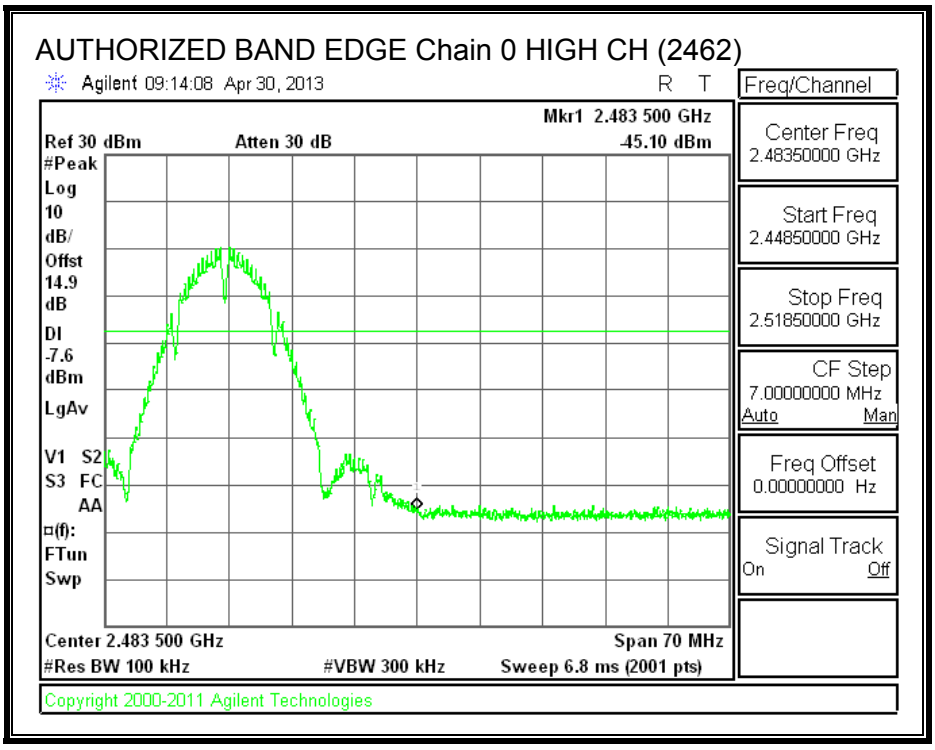
HIGH CHANNEL BANDEDGE, Chain 0





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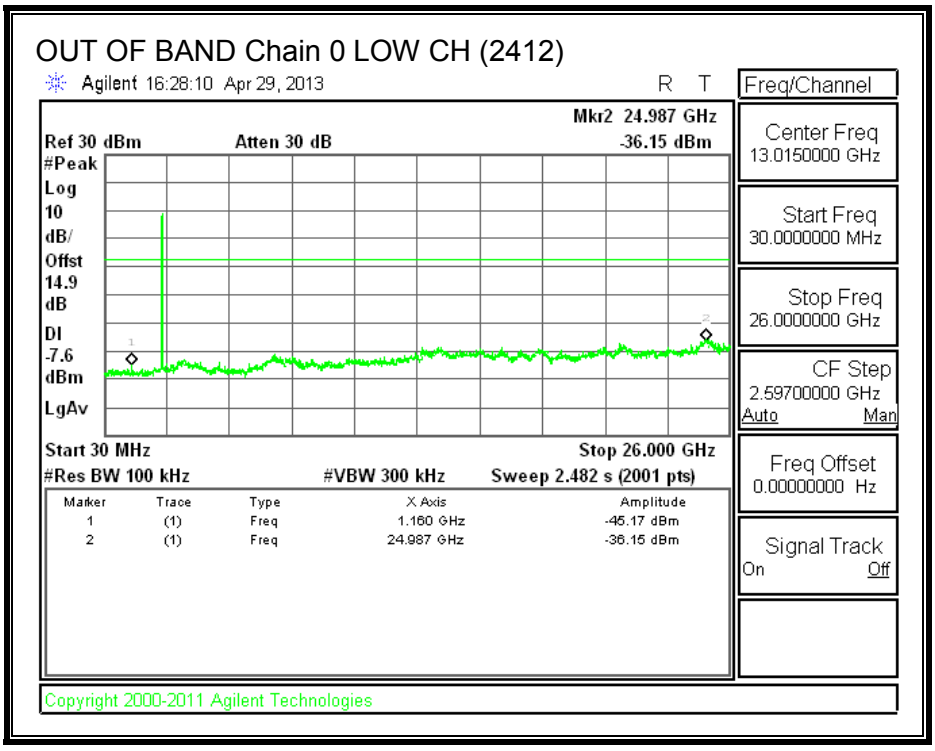
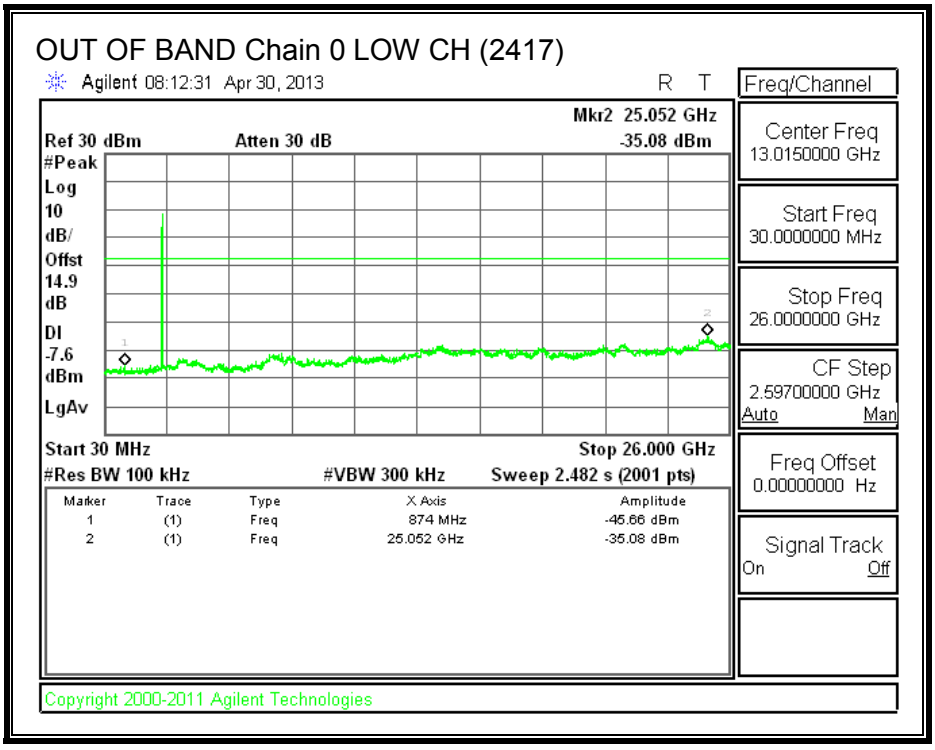
OUT-OF-BAND EMISSIONS, Chain 0





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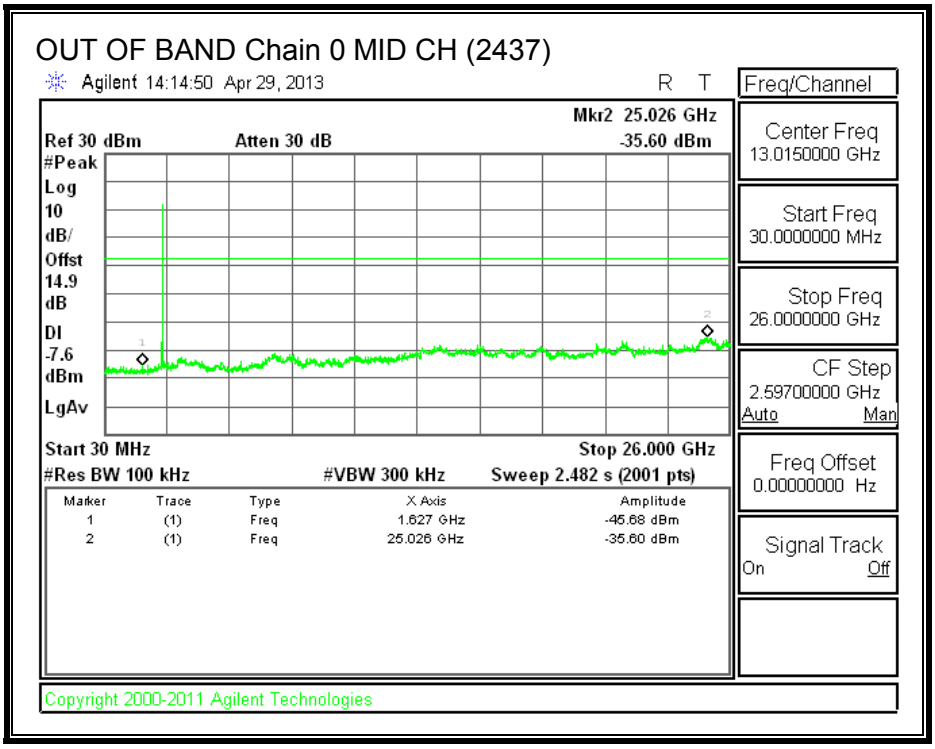

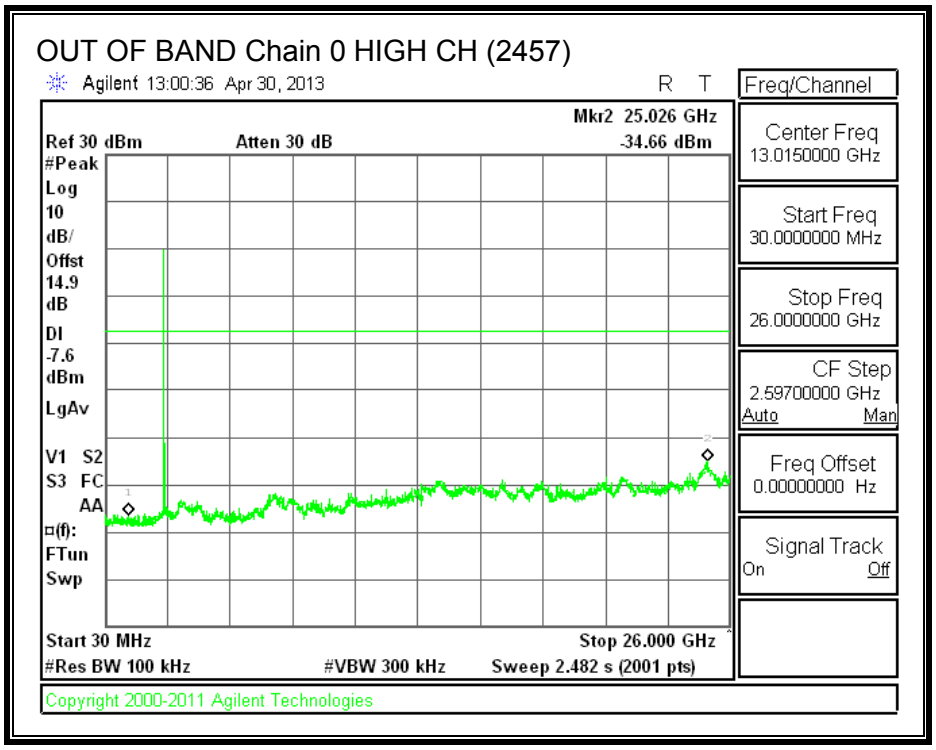

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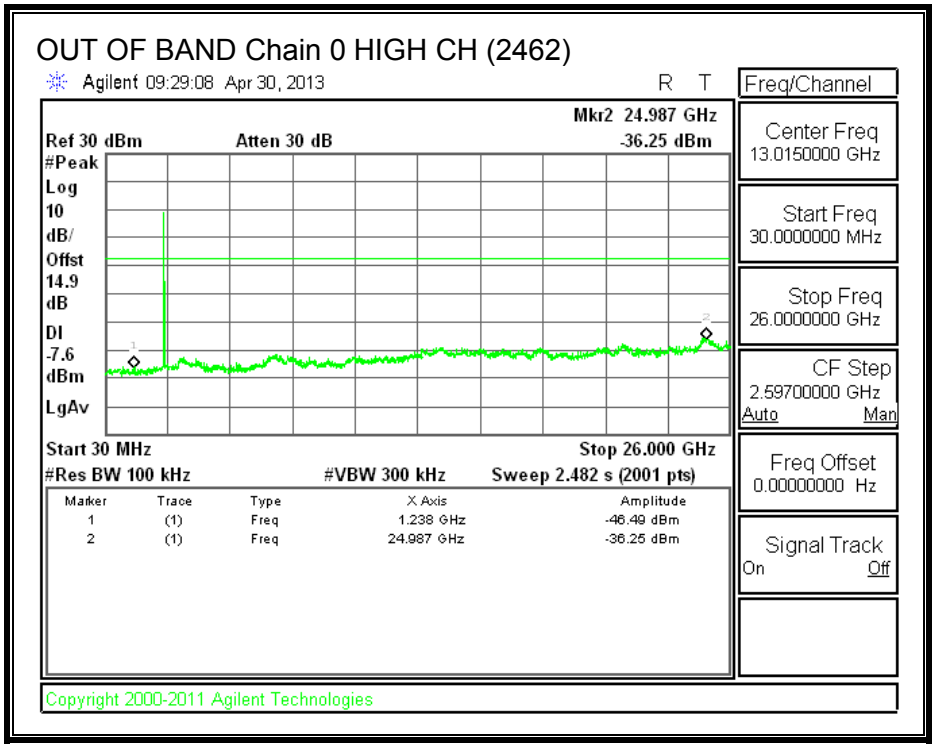

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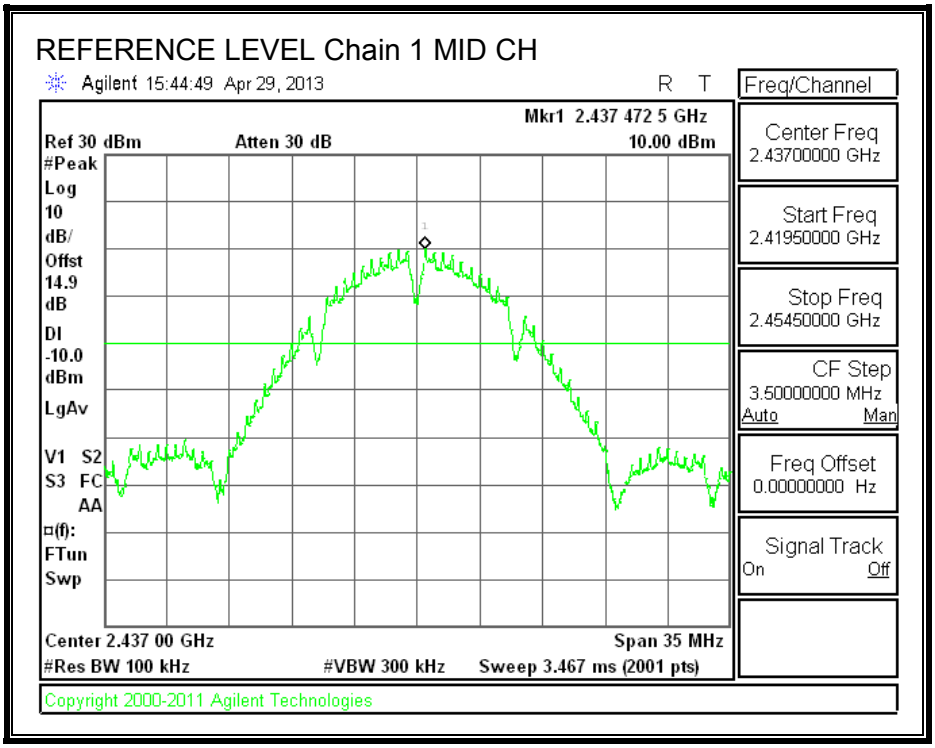
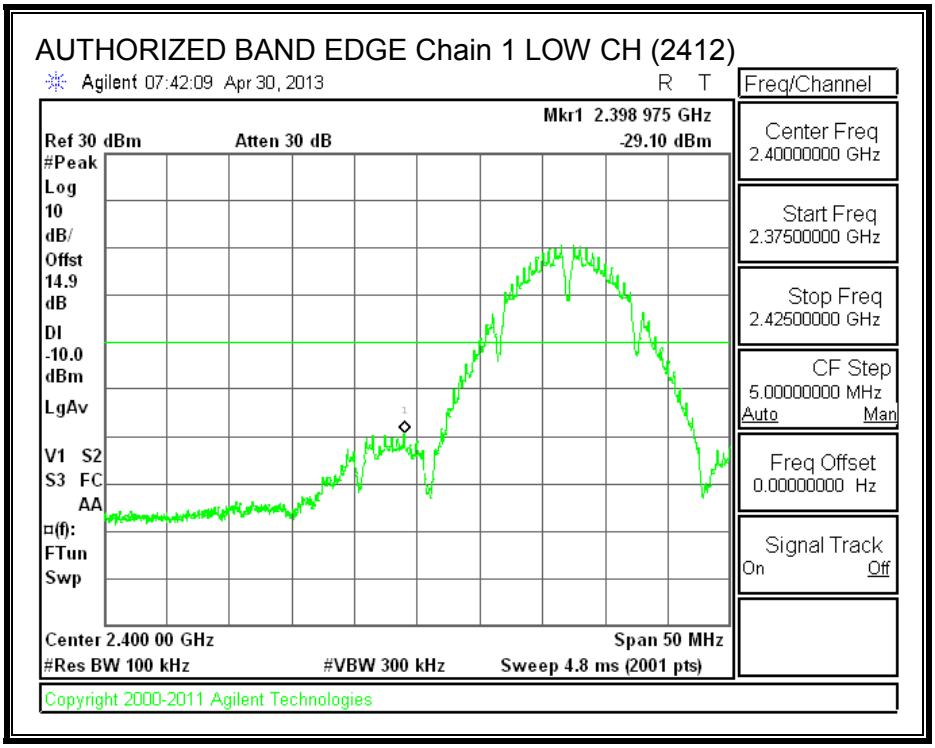
IN-BAND REFERENCE LEVEL, Chain 1



LOW CHANNEL BANDEDGE, Chain 1



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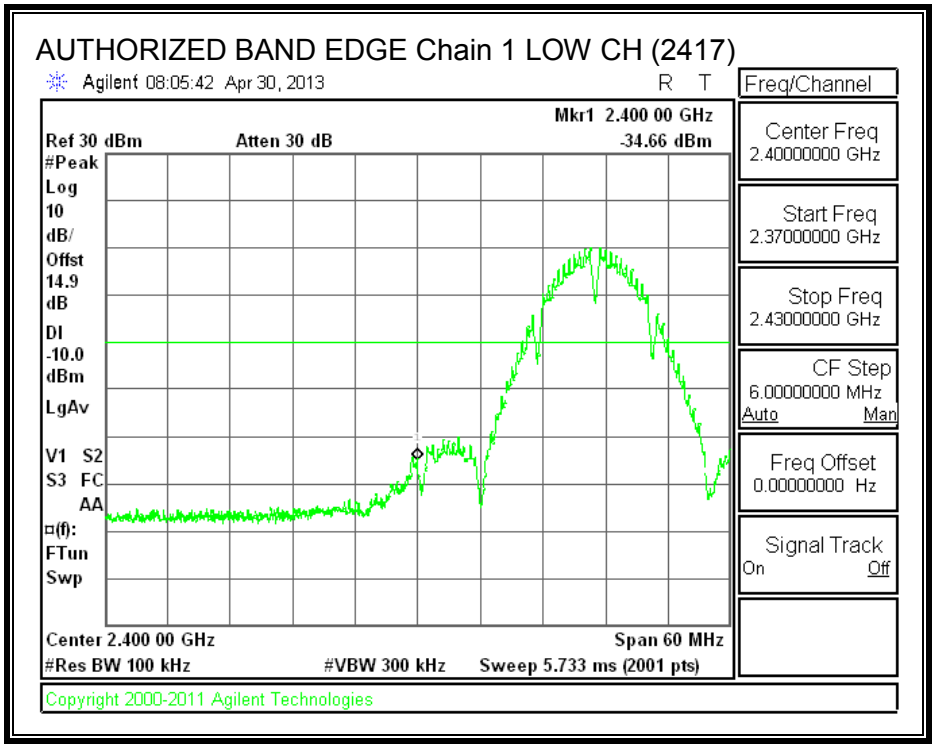
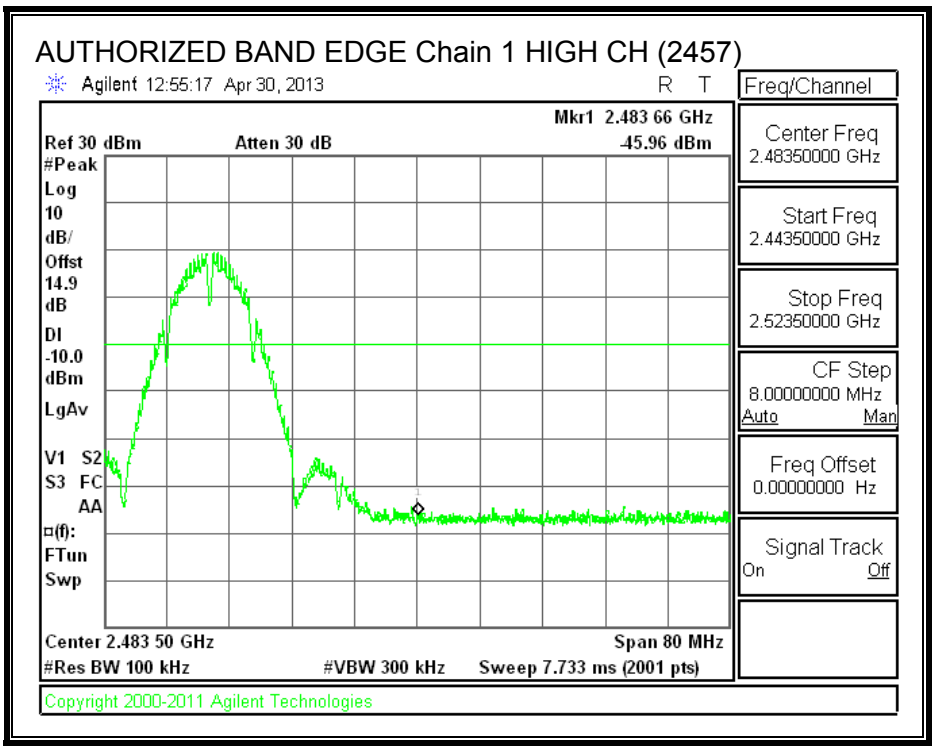


HIGH CHANNEL BANDEDGE, Chain 1



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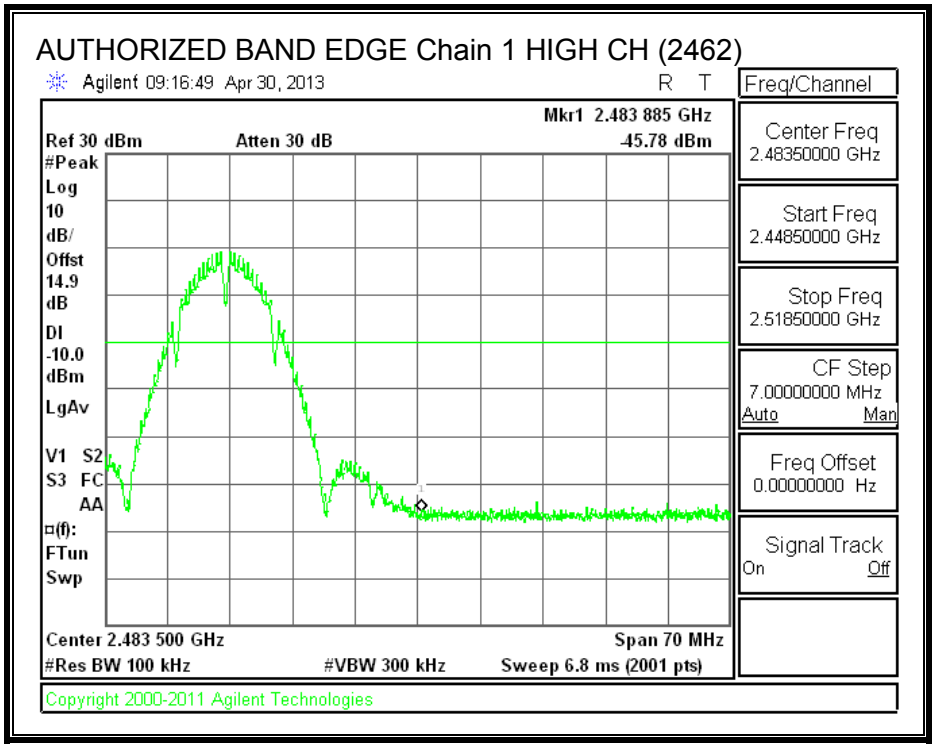
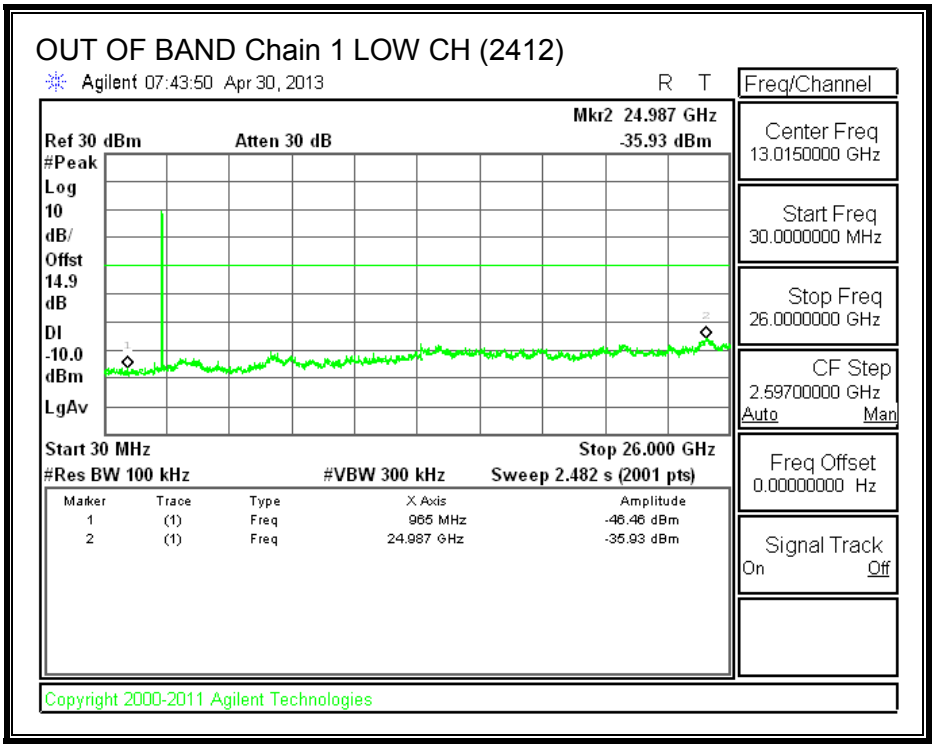


OUT-OF-BAND EMISSIONS, Chain 1



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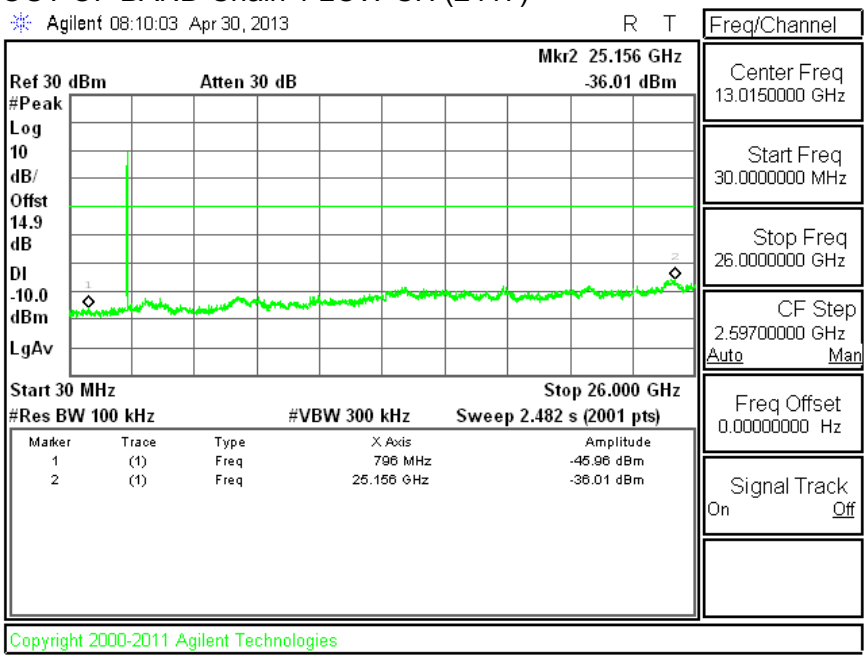
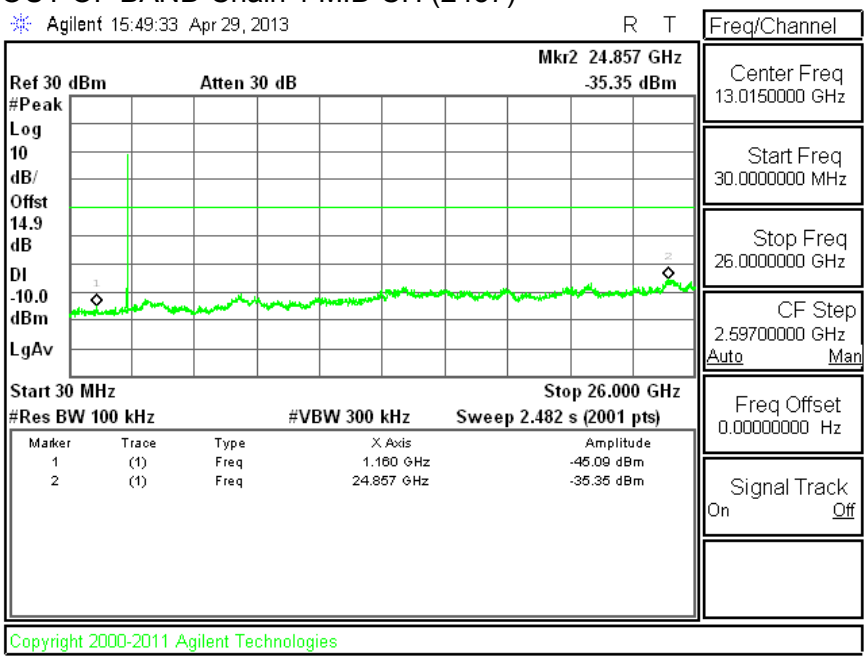
OUT OF BAND Chain 1 LOW CH (2417)



OUT OF BAND Chain 1 MID CH (2437)



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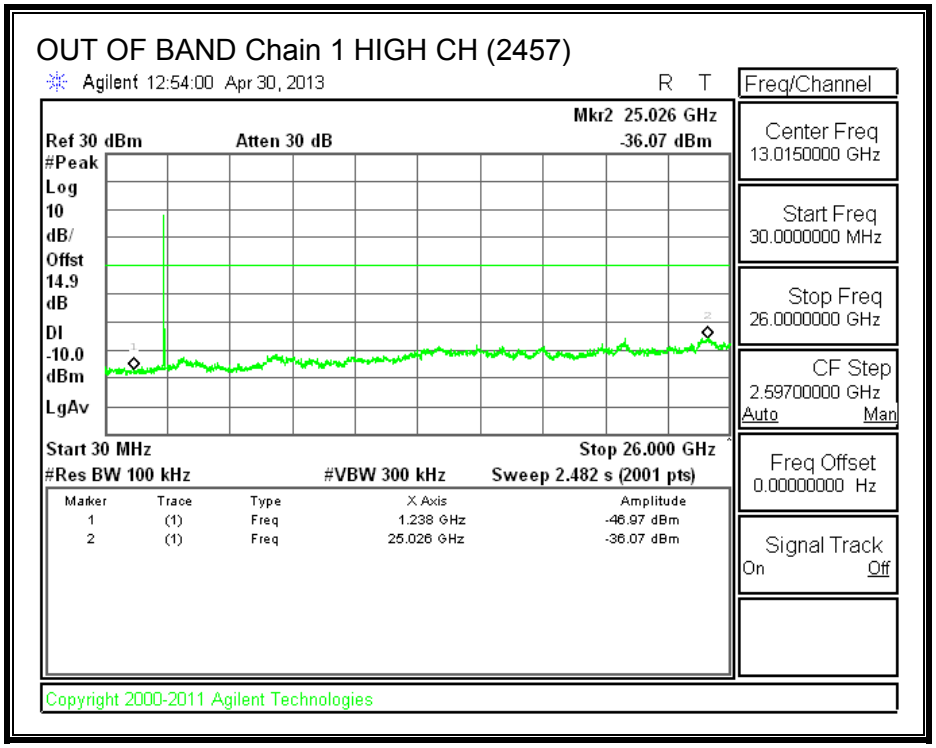
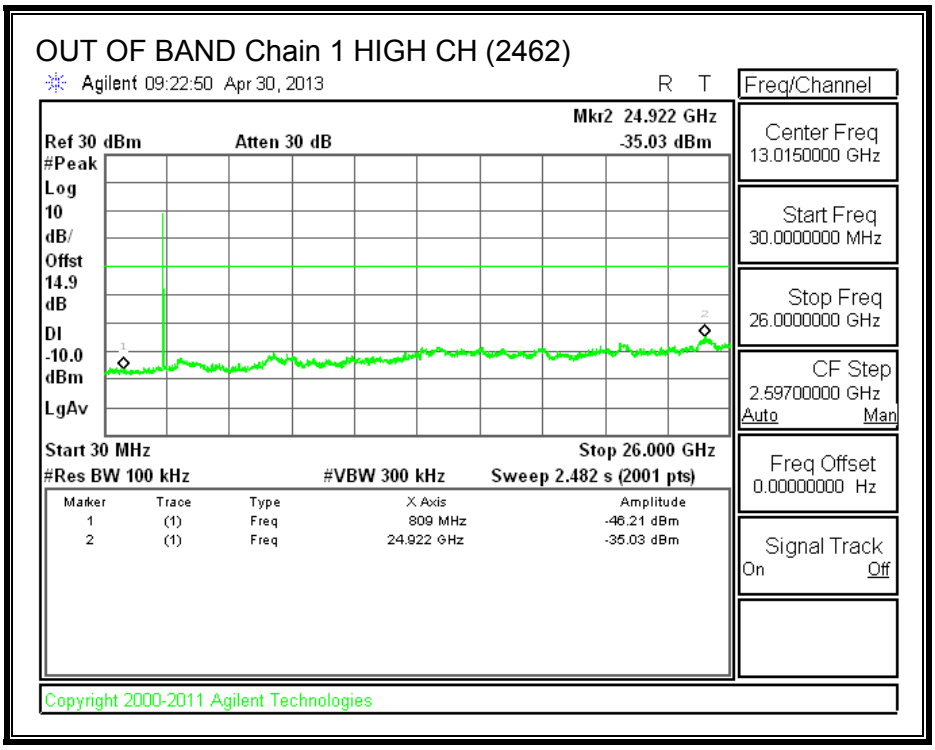
OUT OF BAND Chain 1 HIGH CH (2457)



OUT OF BAND Chain 1 HIGH CH (2462)



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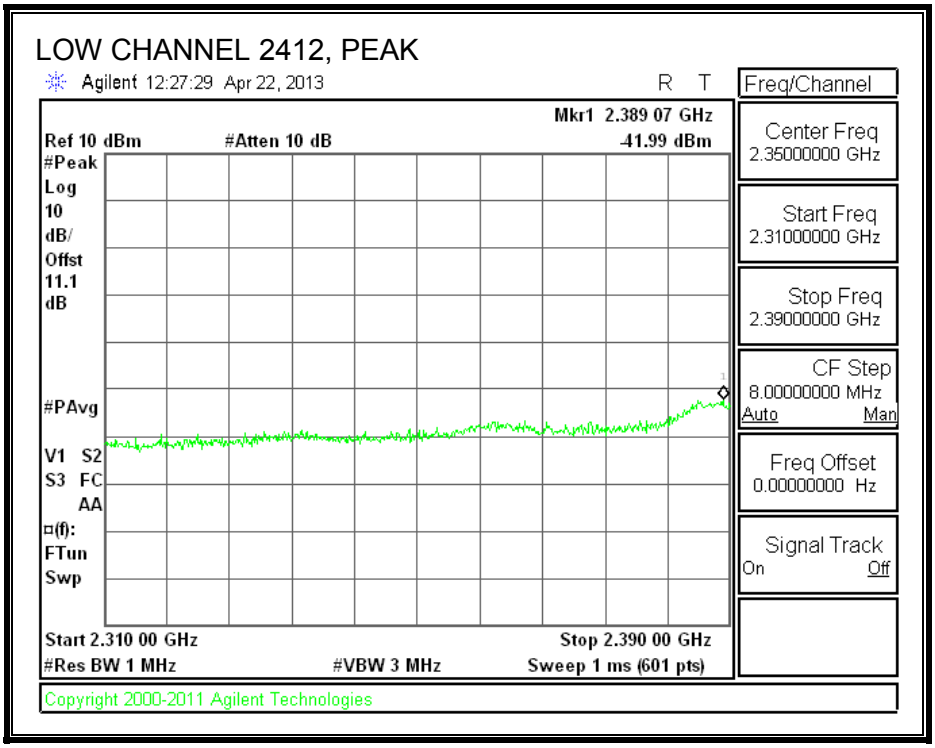
8.1.7. CONDUCTED BE AND SPURIOUS IN RESTRICTED BANDS (no filter unit)

RESTRICTED BANDEDGE
Chain 0



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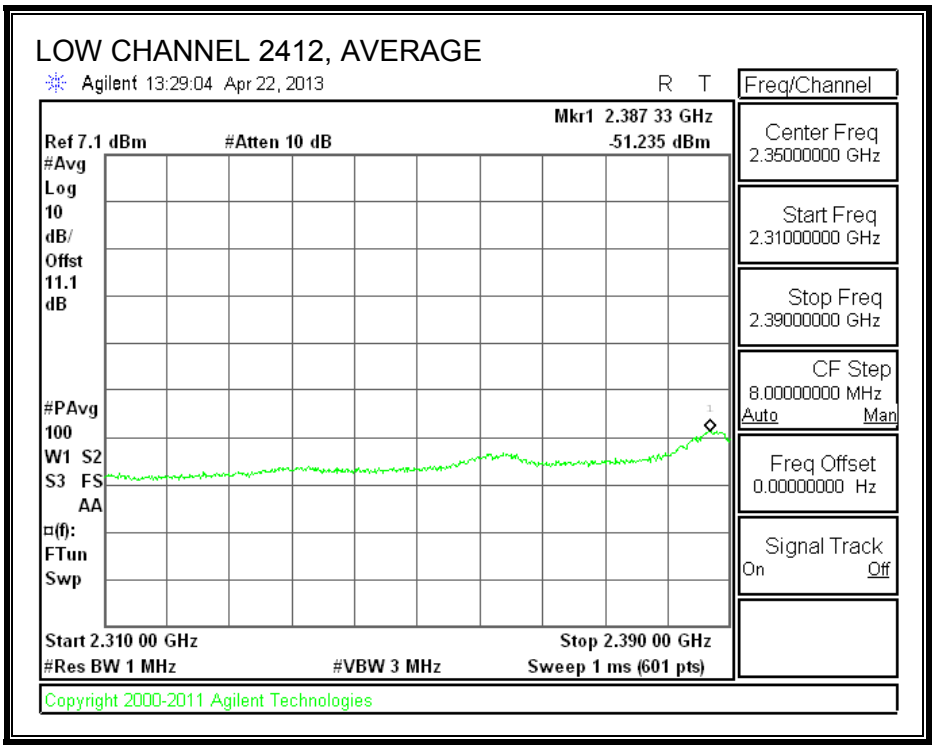
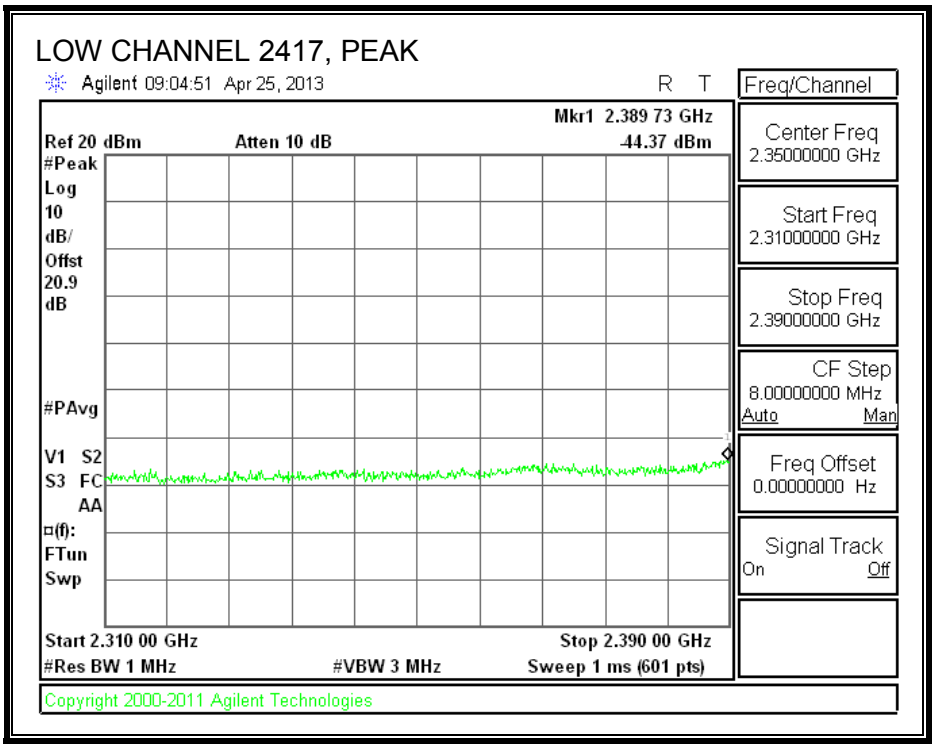
LOW CHANNEL 2412, AVERAGE



LOW CHANNEL 2417, PEAK



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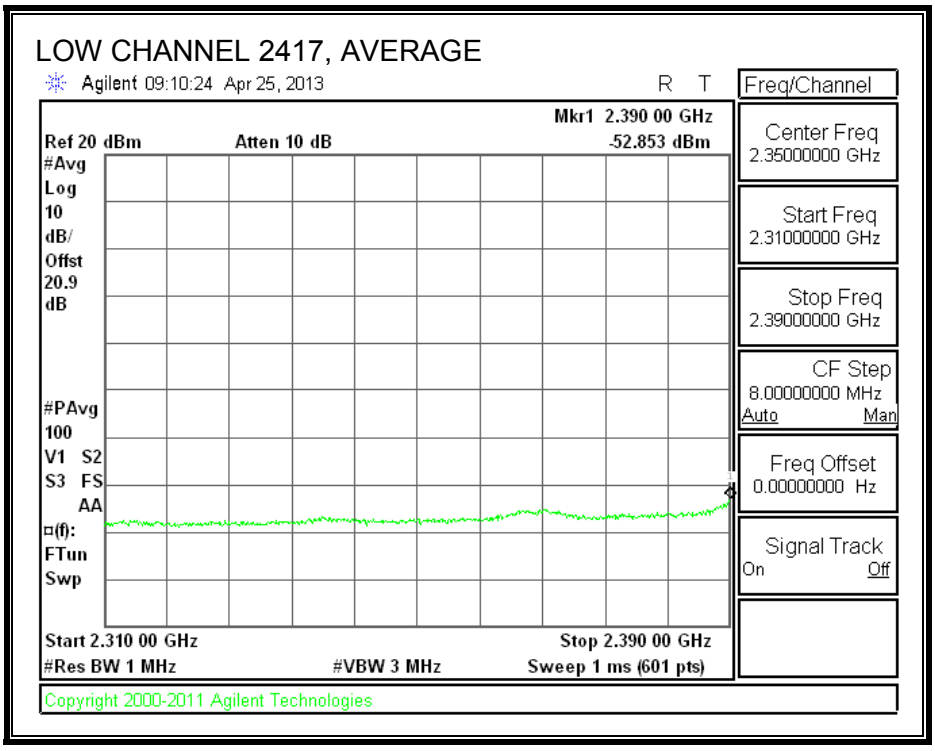
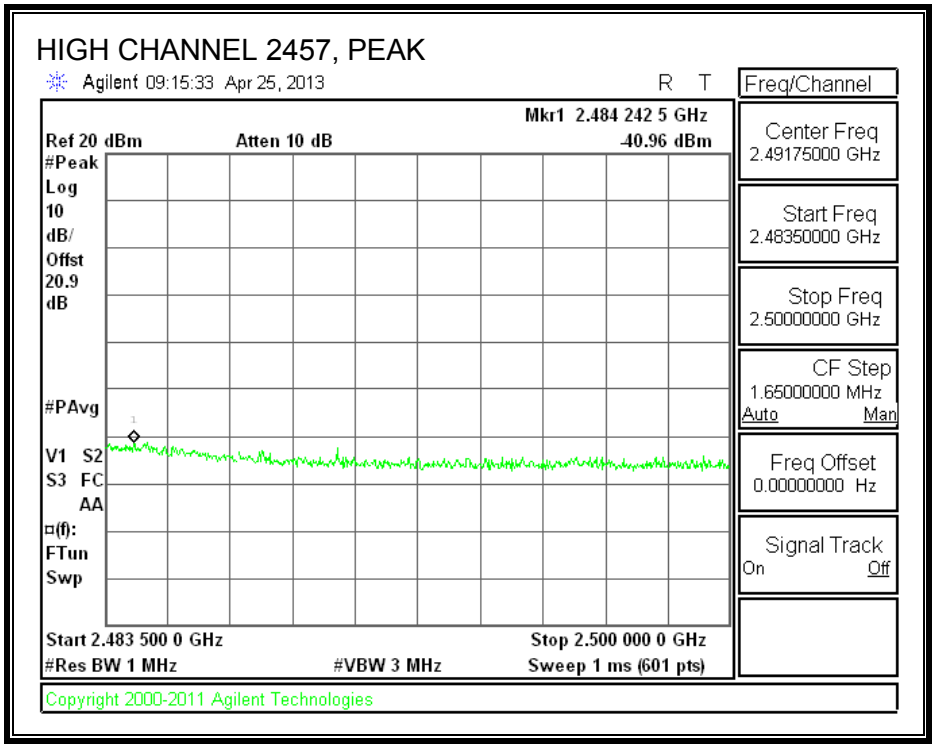
LOW CHANNEL 2417, AVERAGE



HIGH CHANNEL 2457, PEAK



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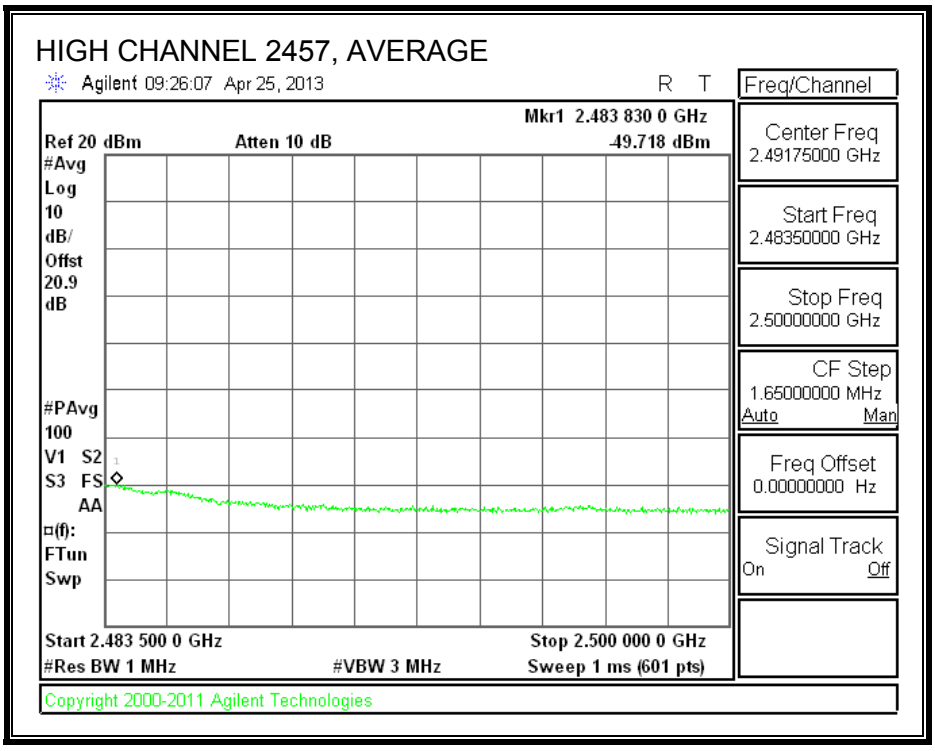

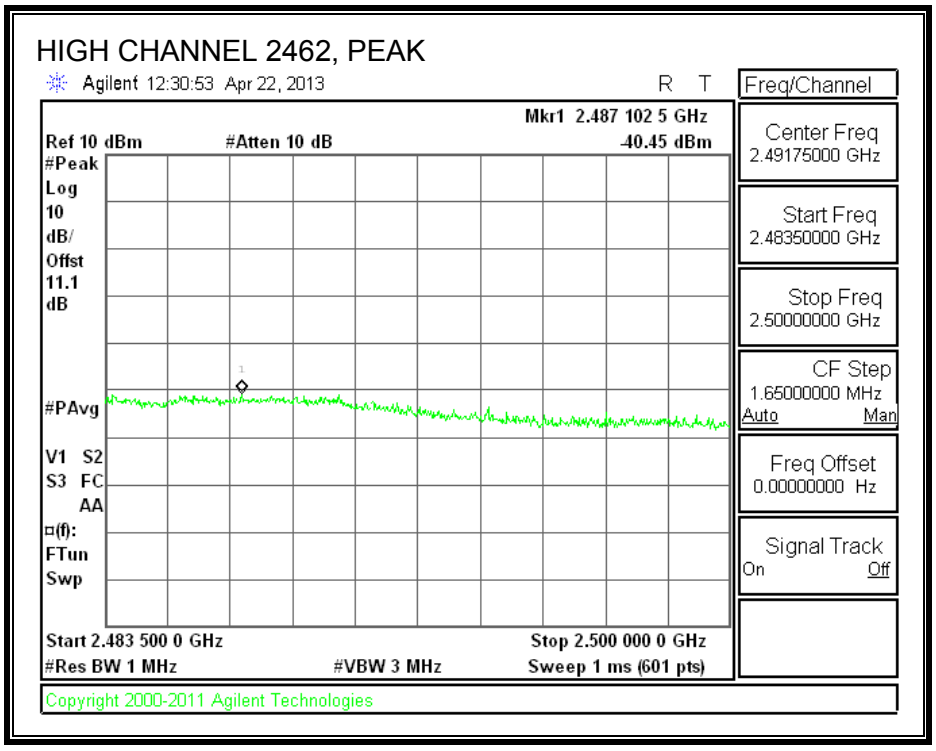

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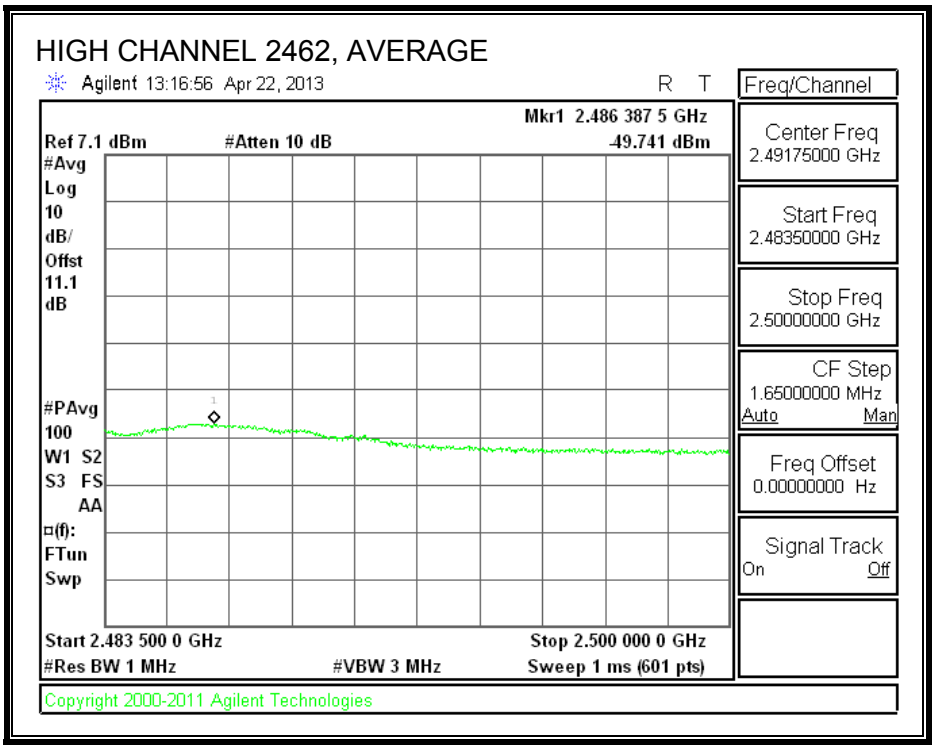

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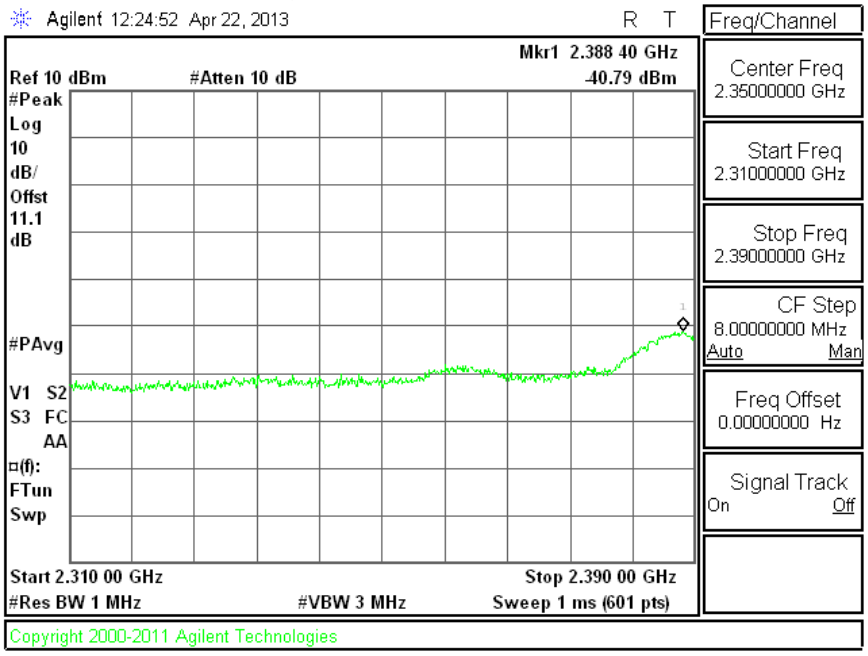
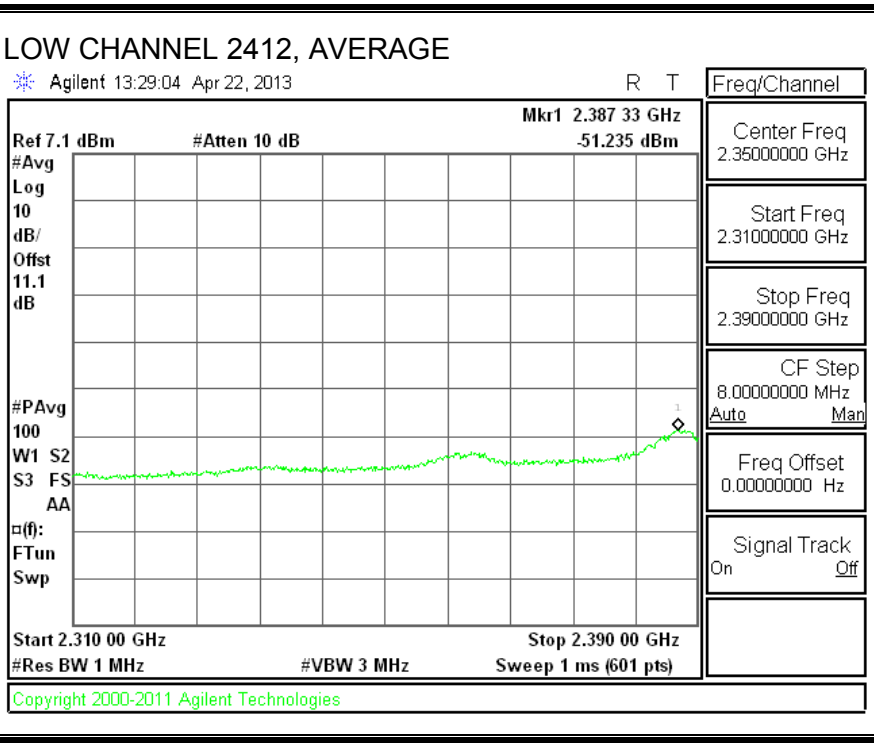
Chain 1

LOW CHANNEL 2412, PEAK



LOW CHANNEL 2412, AVERAGE



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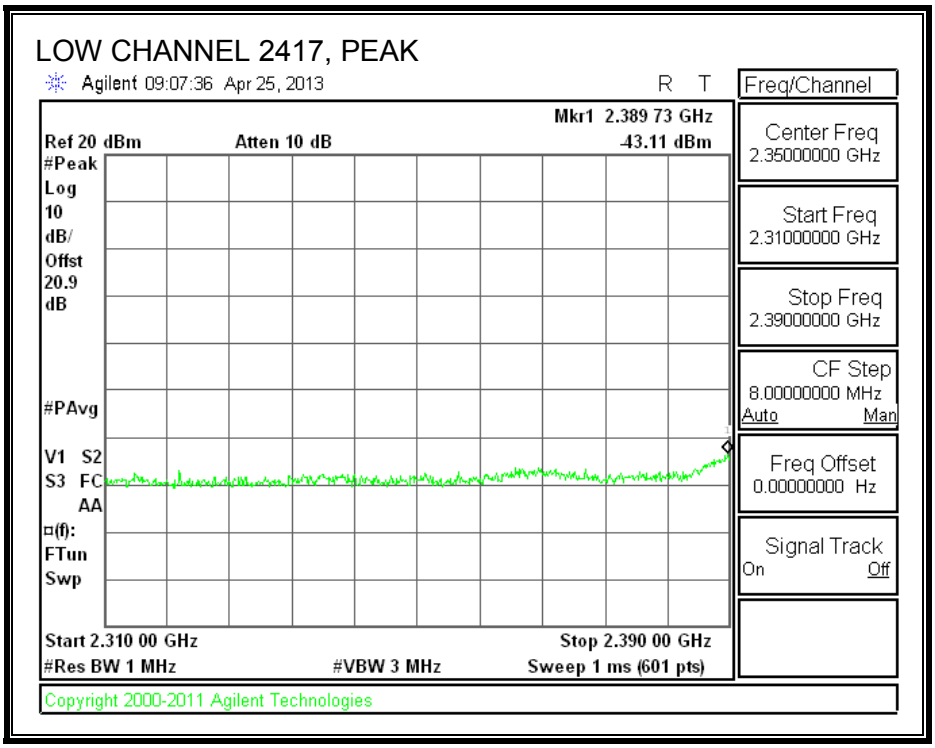
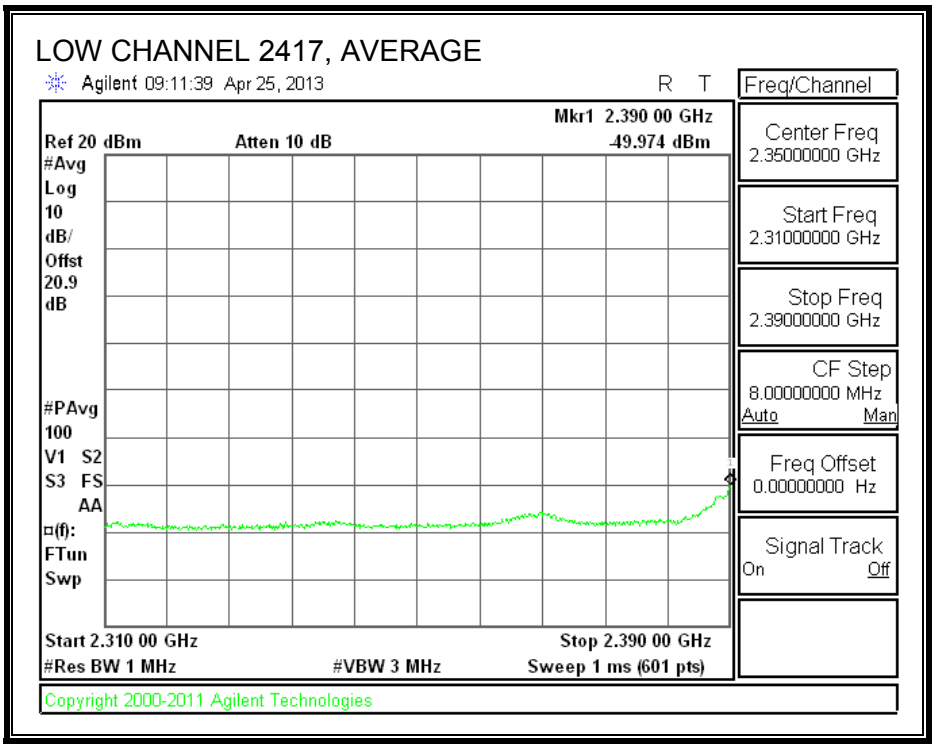
LOW CHANNEL 2417, PEAK



LOW CHANNEL 2417, AVERAGE



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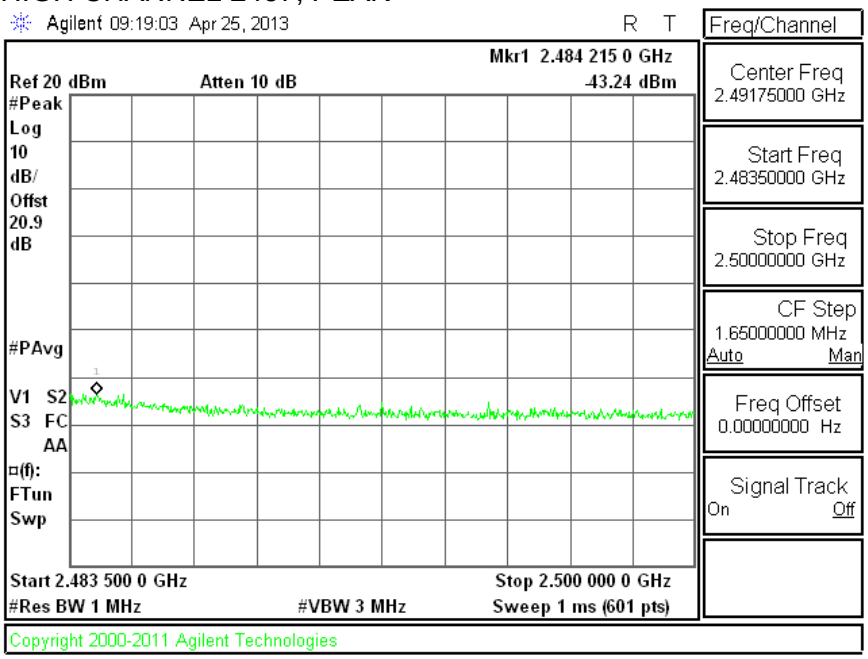
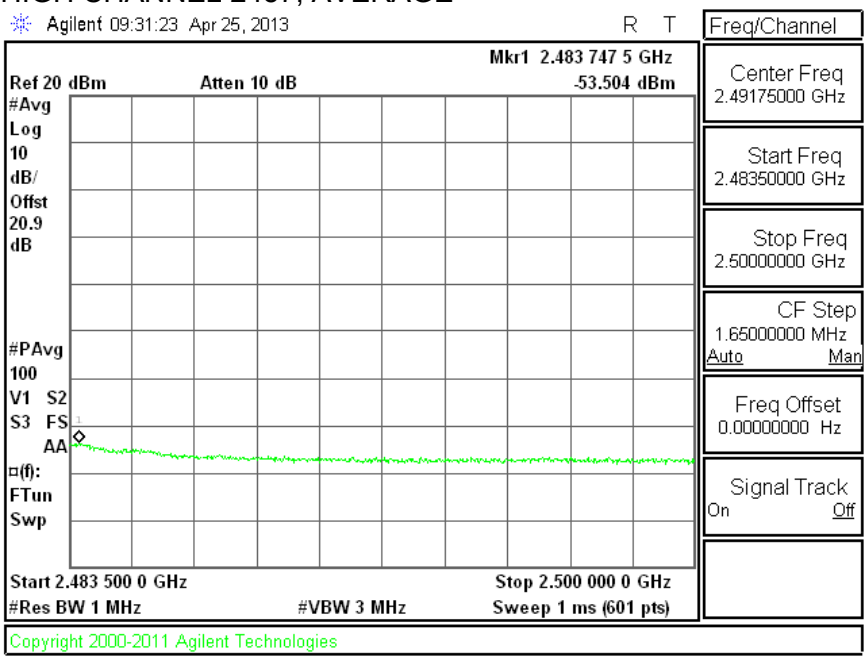
HIGH CHANNEL 2457, PEAK



HIGH CHANNEL 2457, AVERAGE



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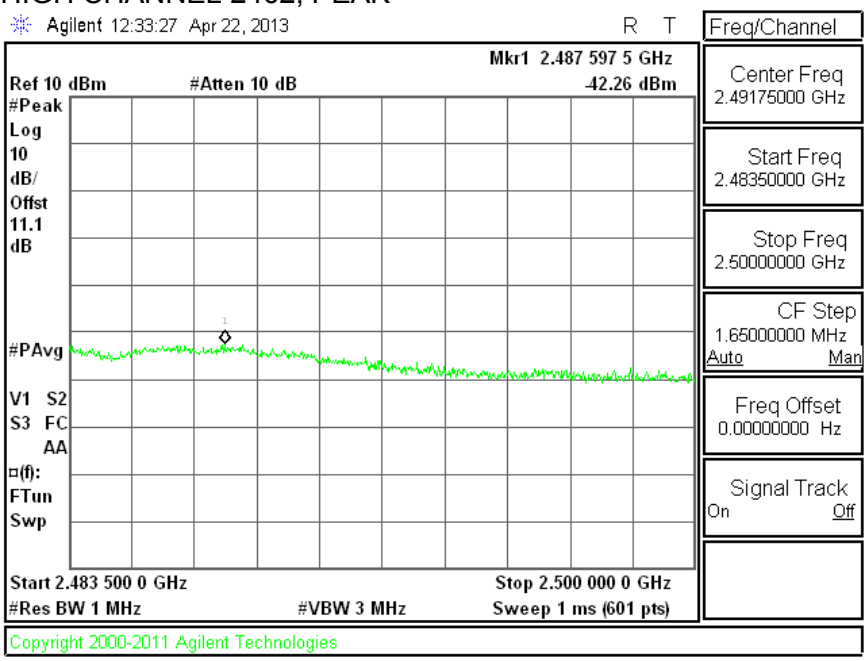
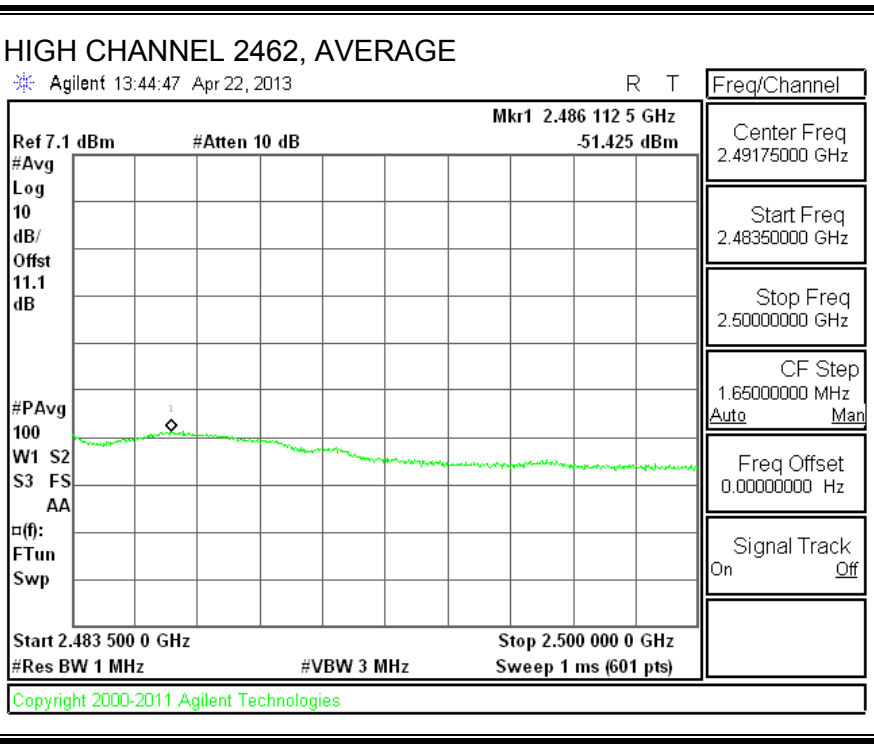
HIGH CHANNEL 2462, PEAK



HIGH CHANNEL 2462, AVERAGE



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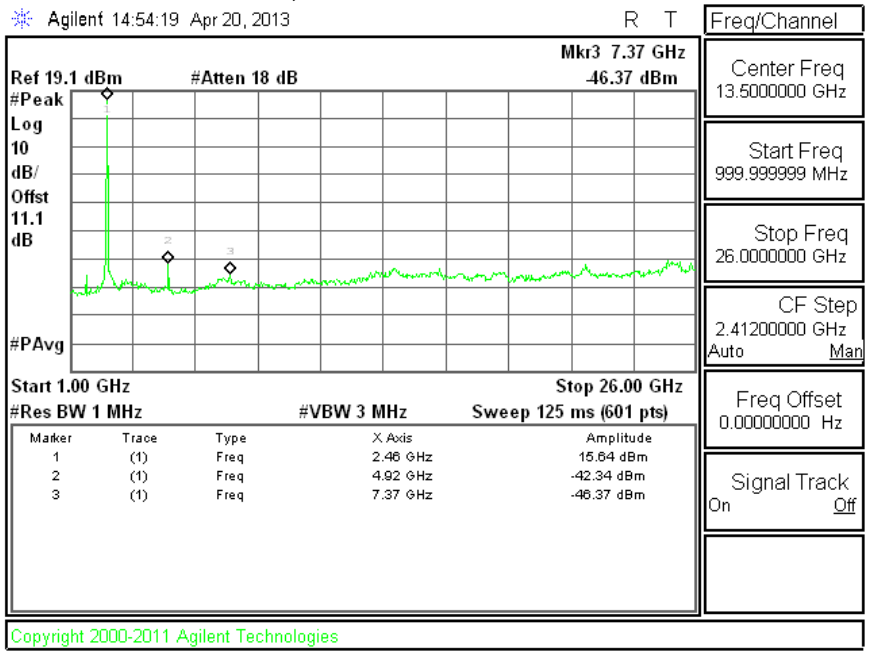
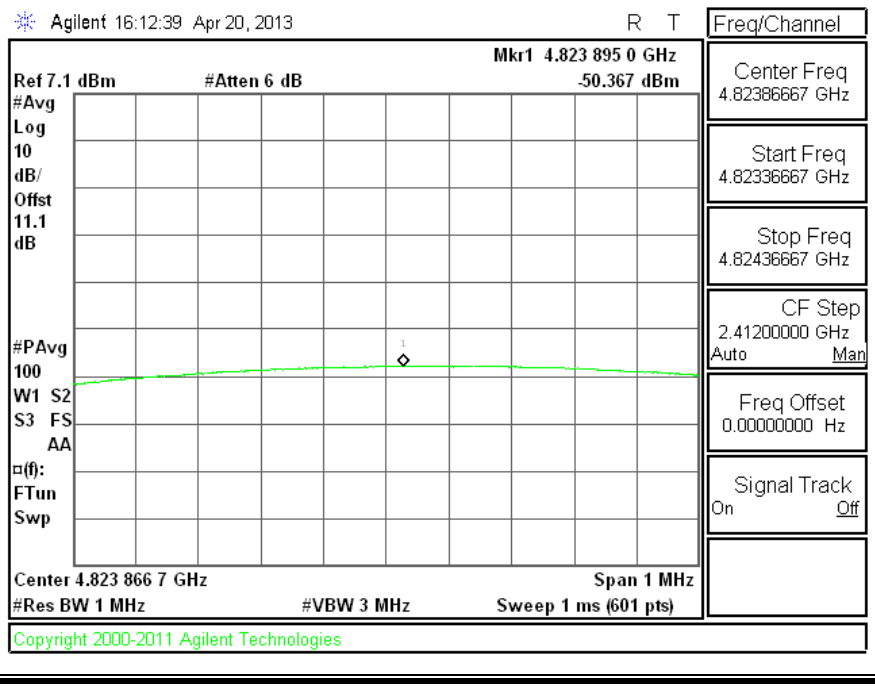
HARMONICS AND SPURIOUS

Chain 0

LOW CHANNEL 2412, PEAK



LOW CHANNEL 2412, AVERAGE



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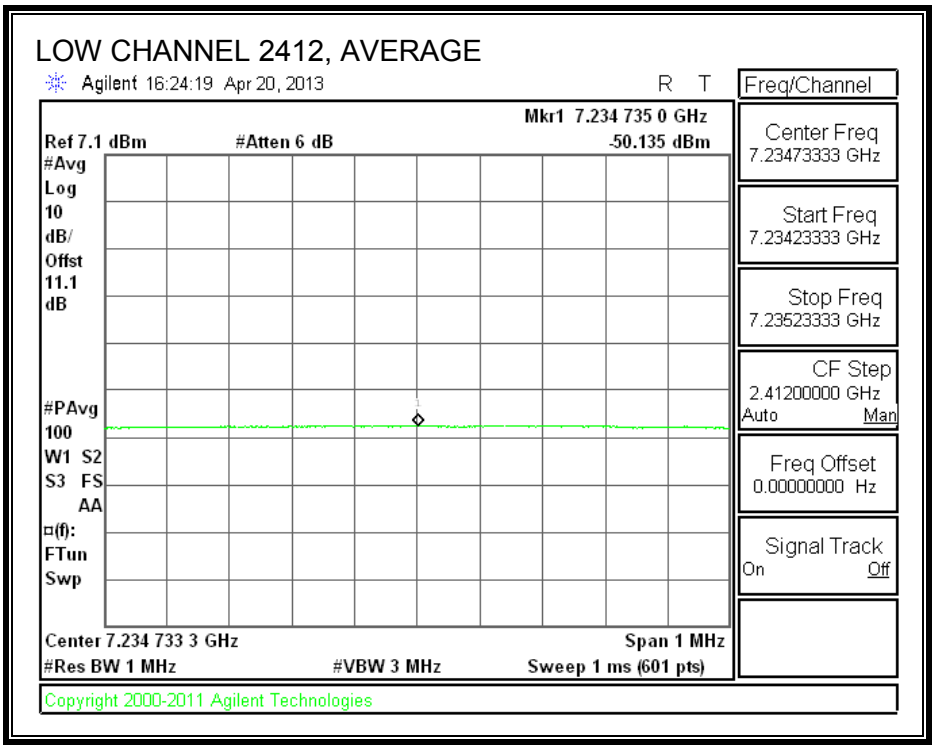
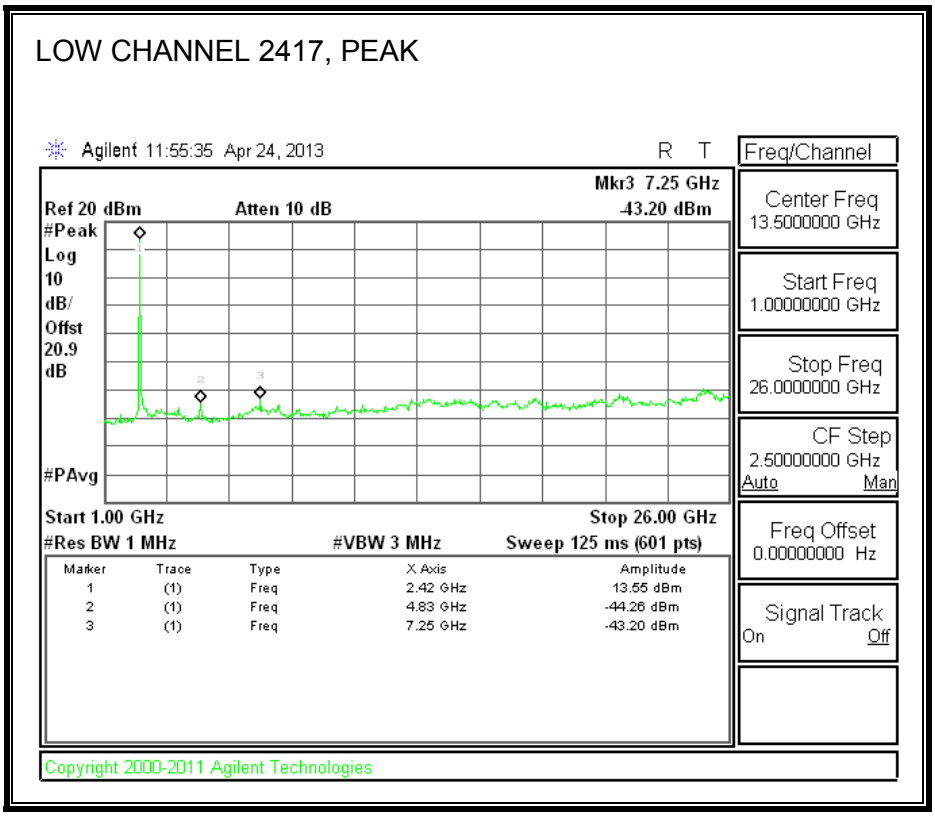
LOW CHANNEL 2412, AVERAGE



LOW CHANNEL 2417, PEAK



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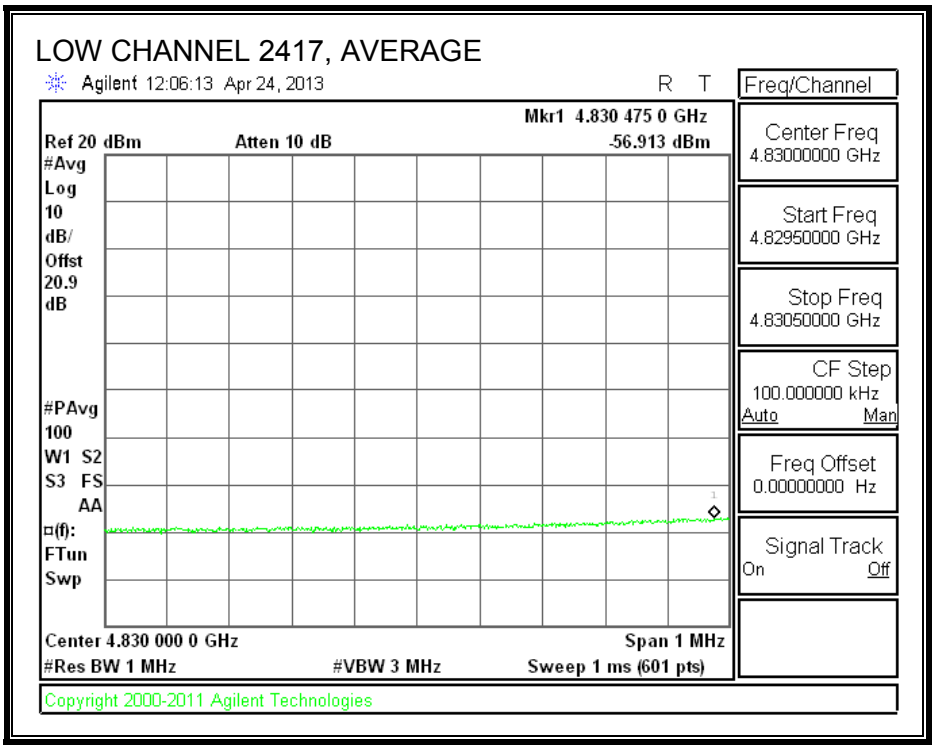

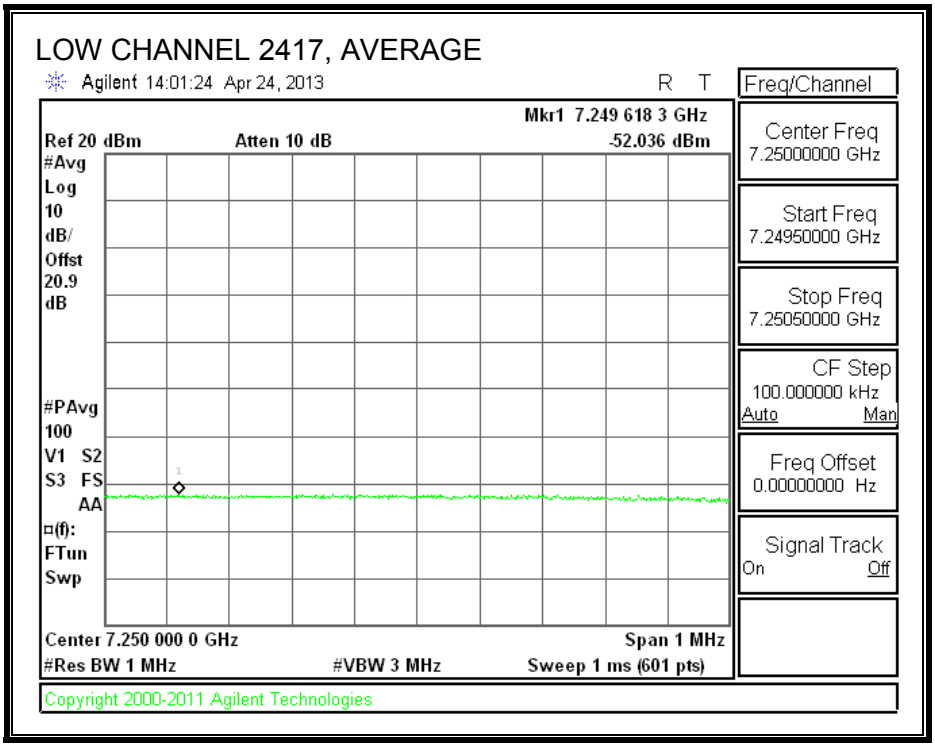

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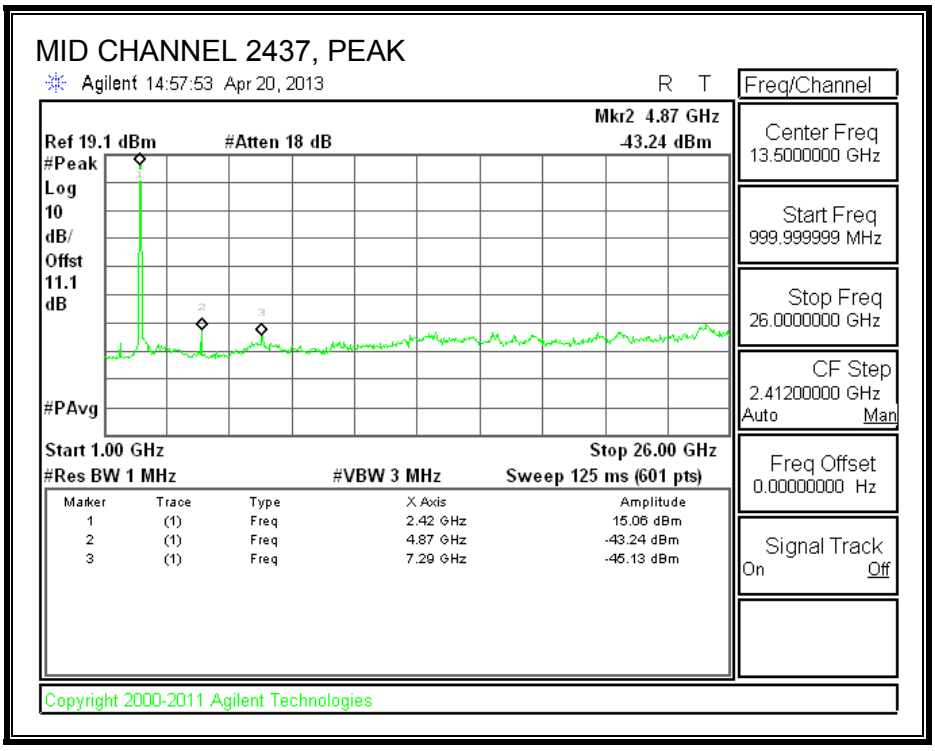
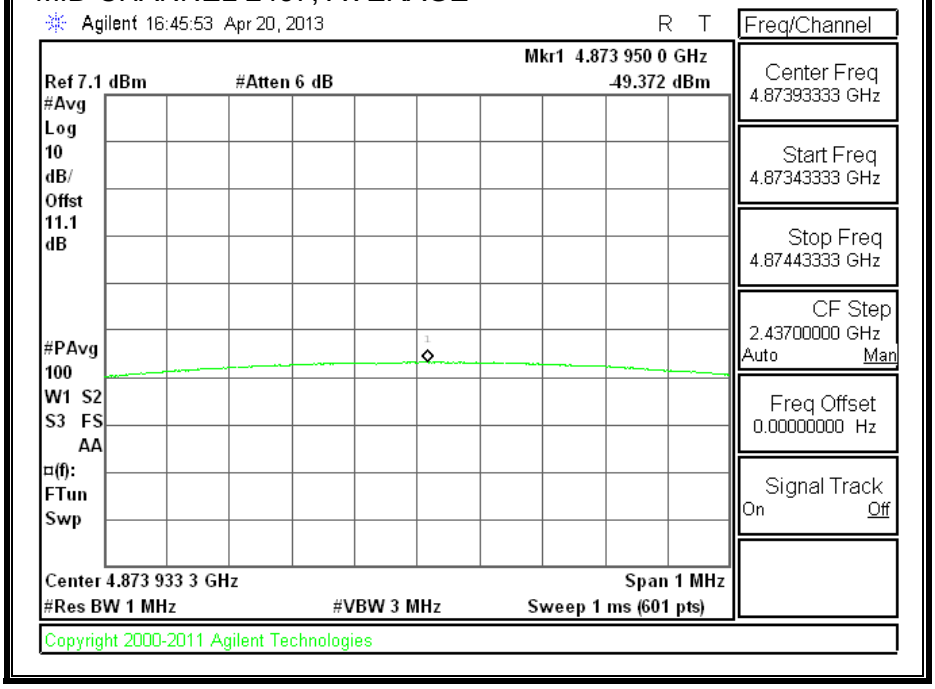
MID CHANNEL 2437, PEAK



MID CHANNEL 2437, AVERAGE



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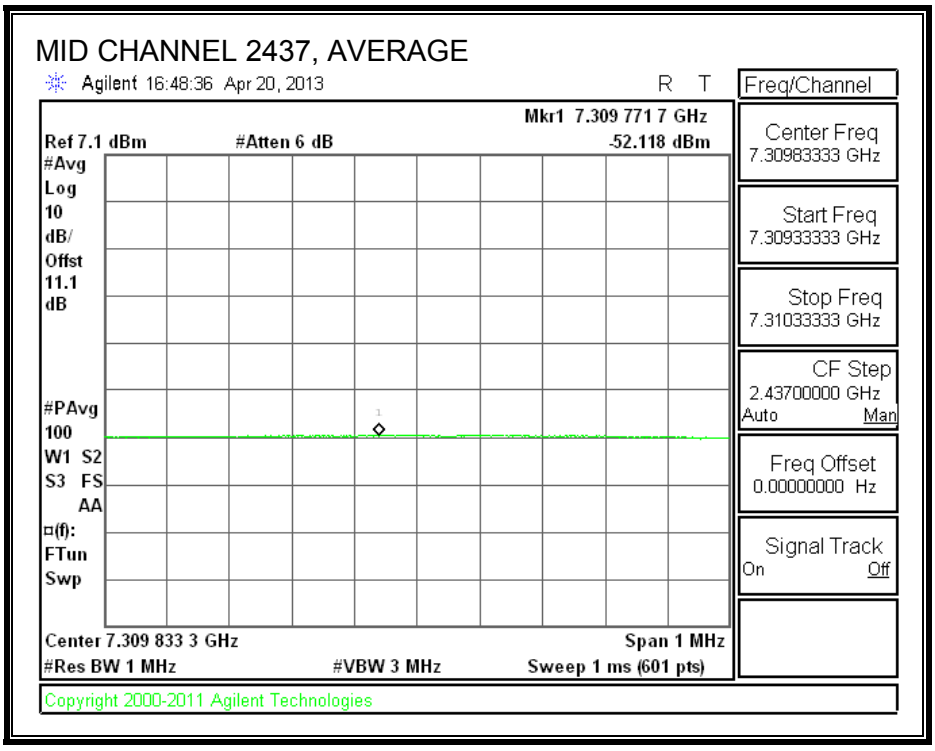
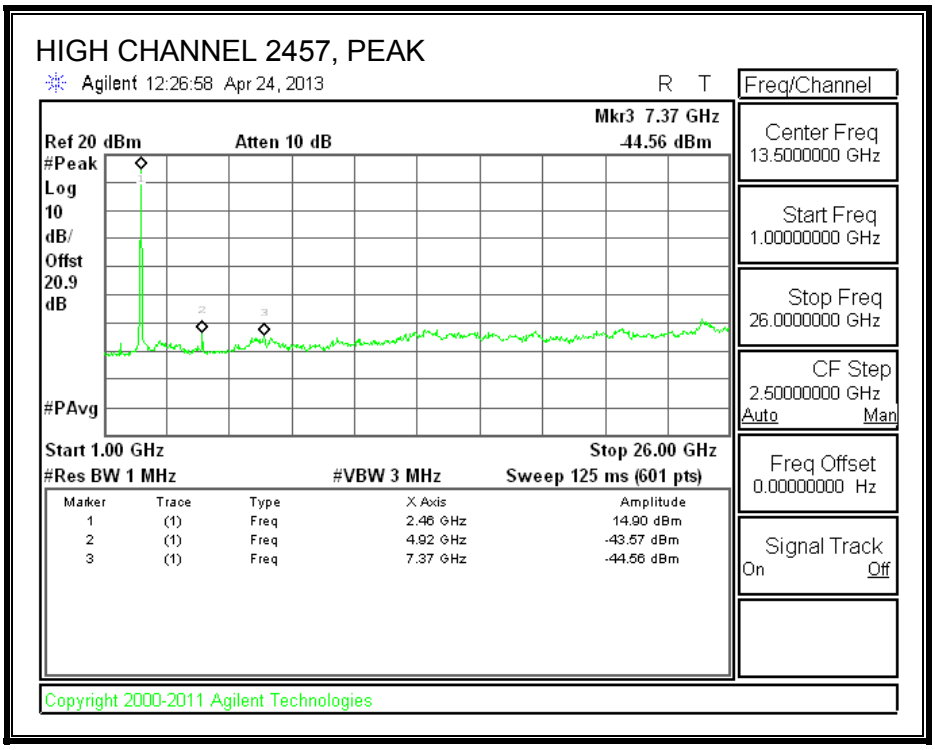
MID CHANNEL 2437, AVERAGE



HIGH CHANNEL 2457, PEAK



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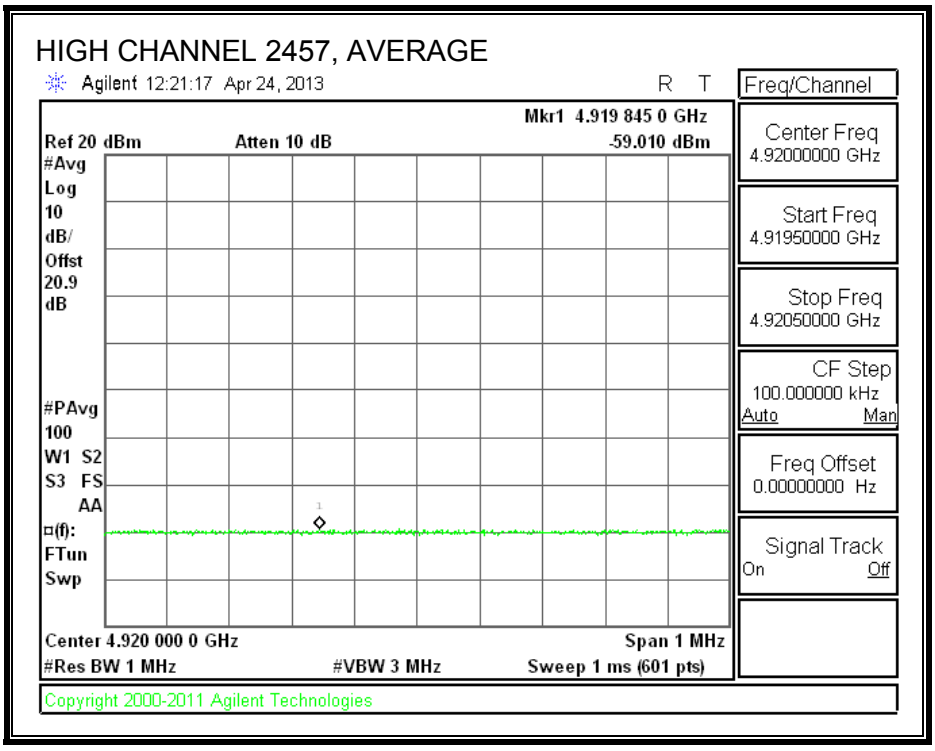

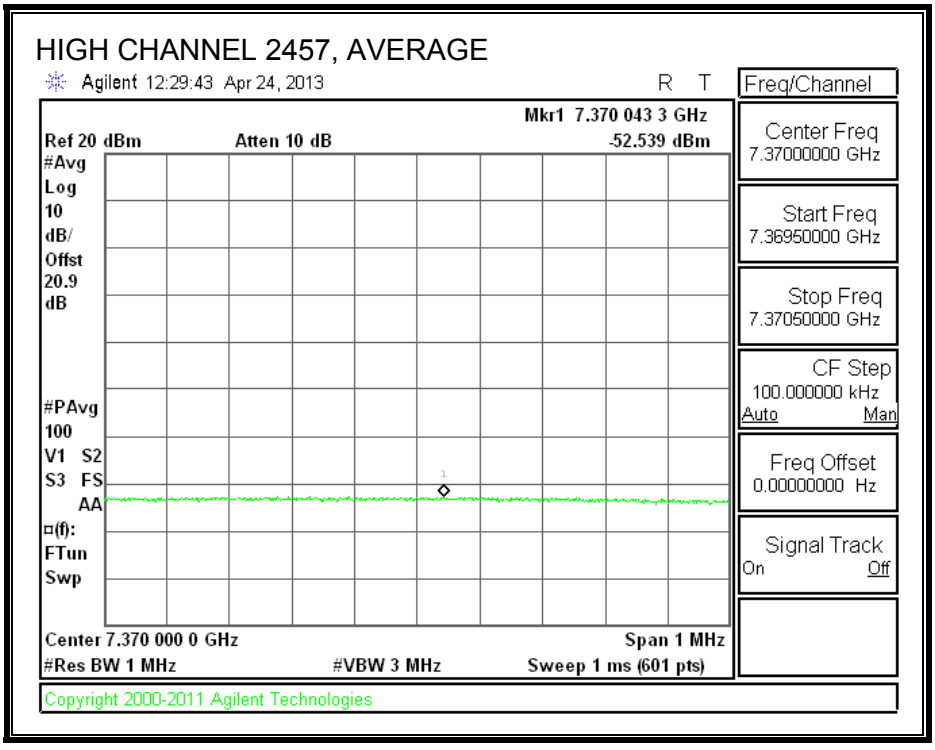

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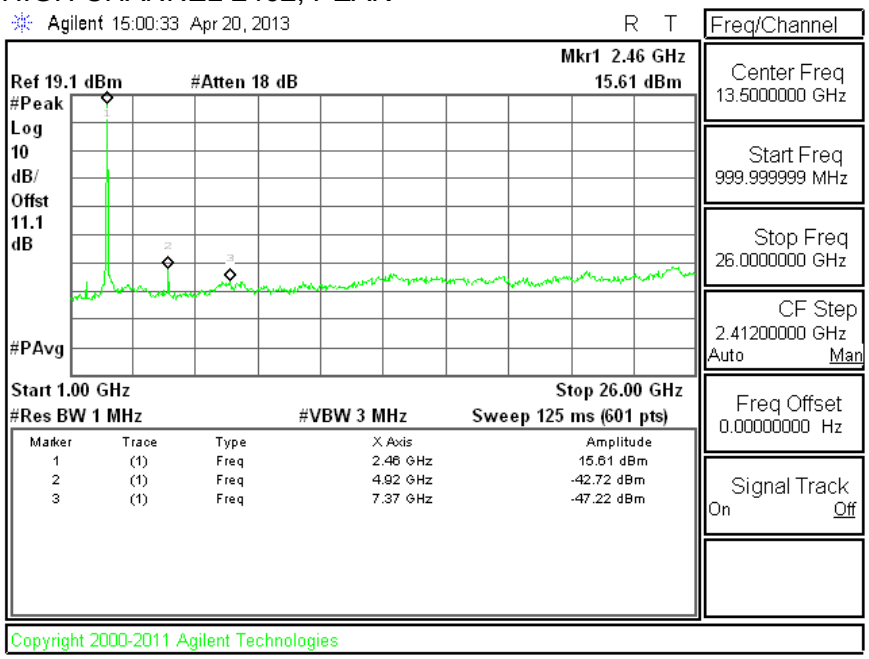
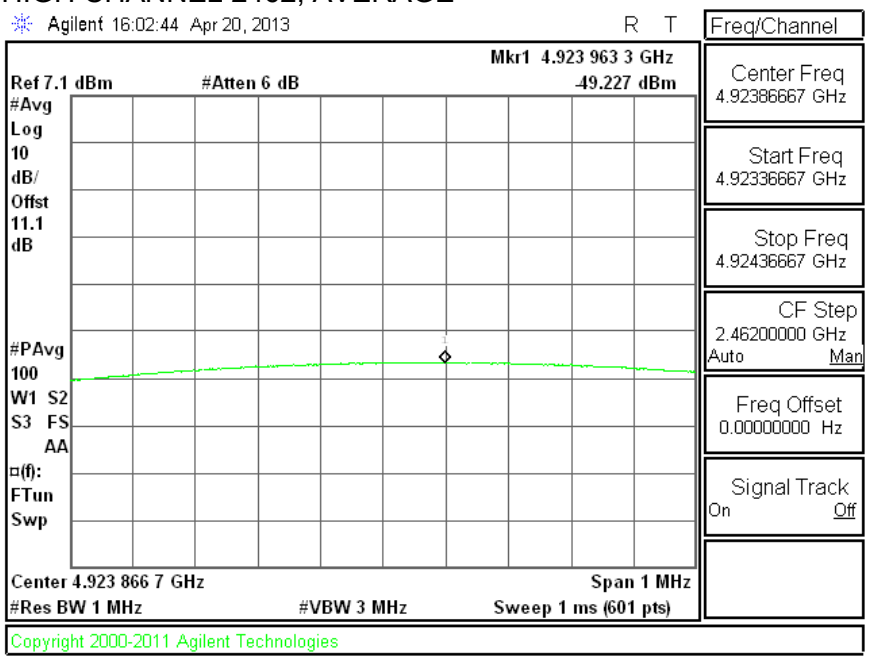
HIGH CHANNEL 2462, PEAK



HIGH CHANNEL 2462, AVERAGE



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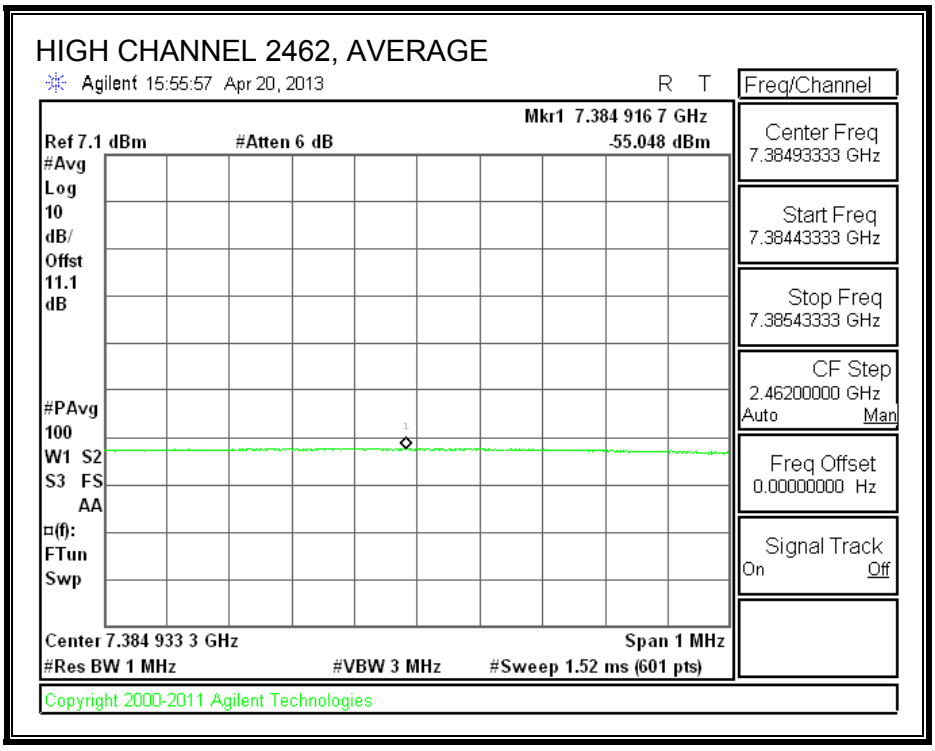

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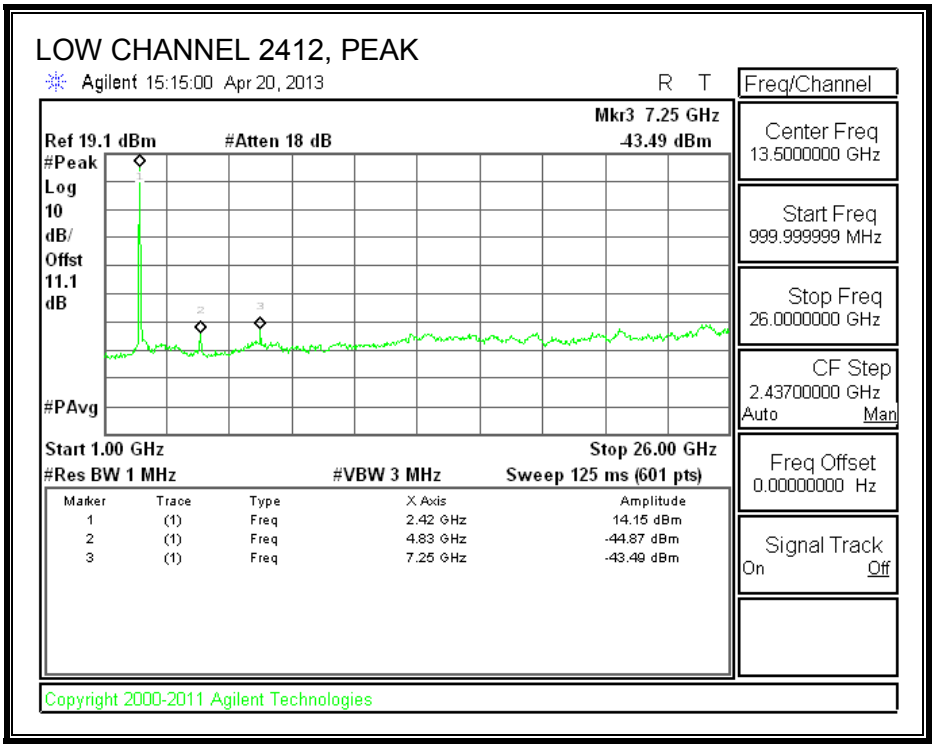
Chain 1

RESTRICTED BANDEDGE (LOW CHANNEL)



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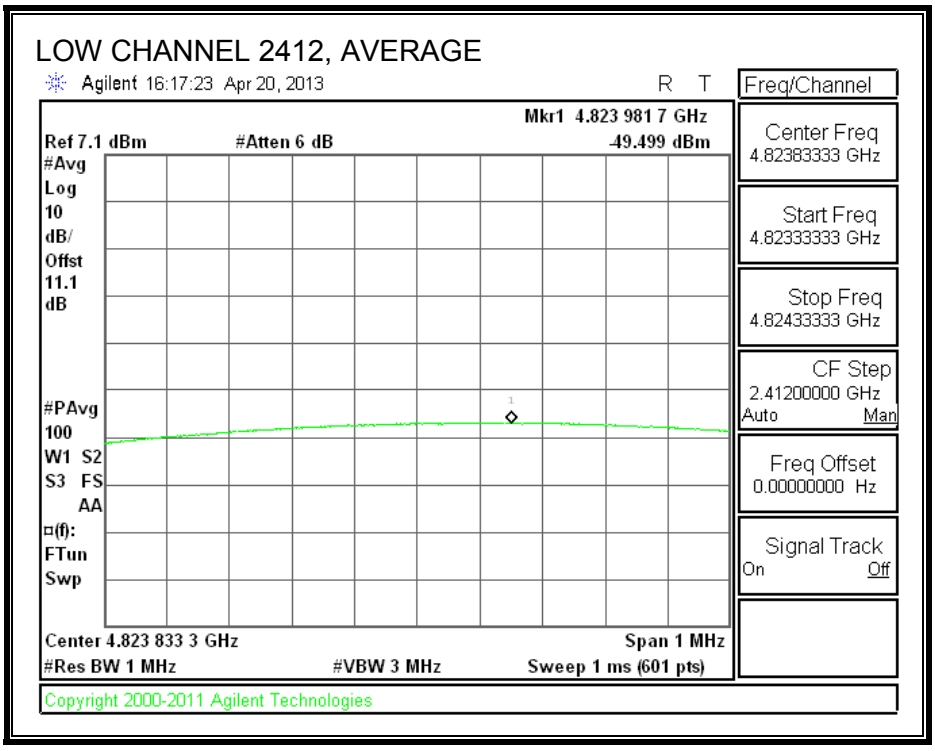

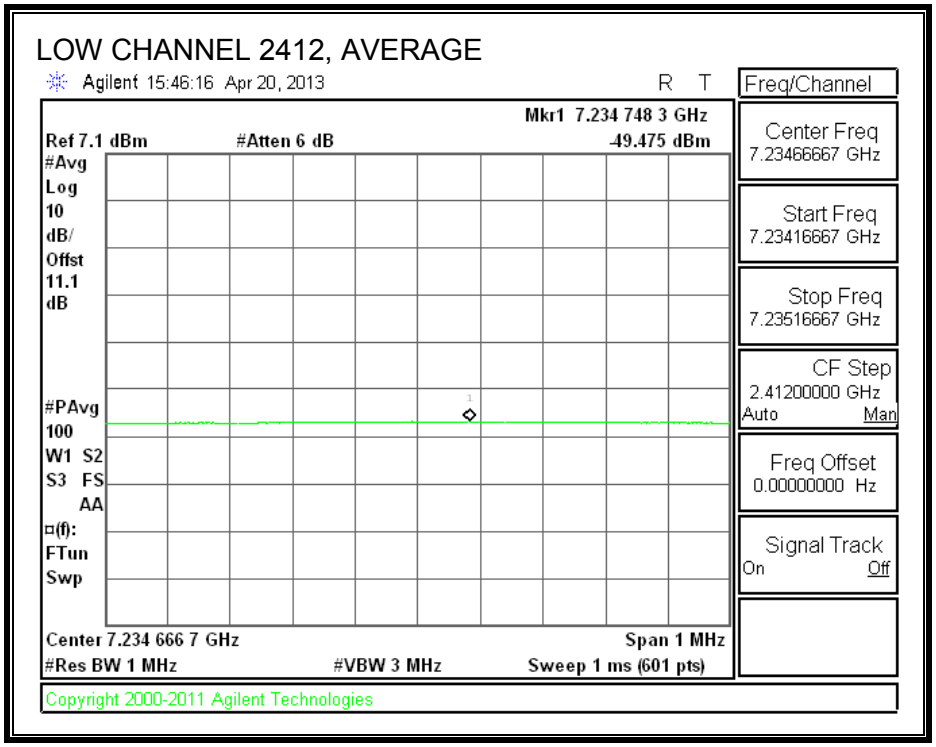

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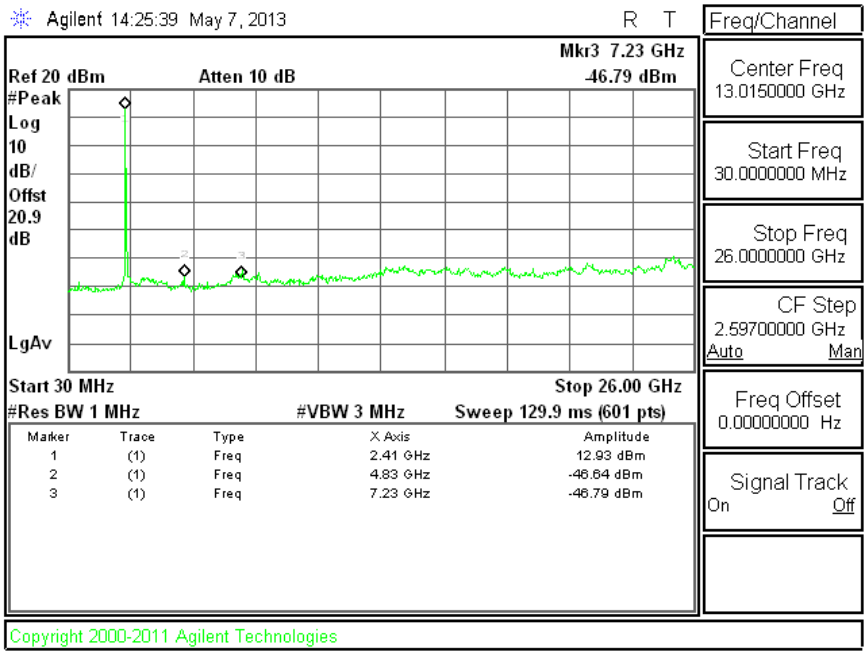
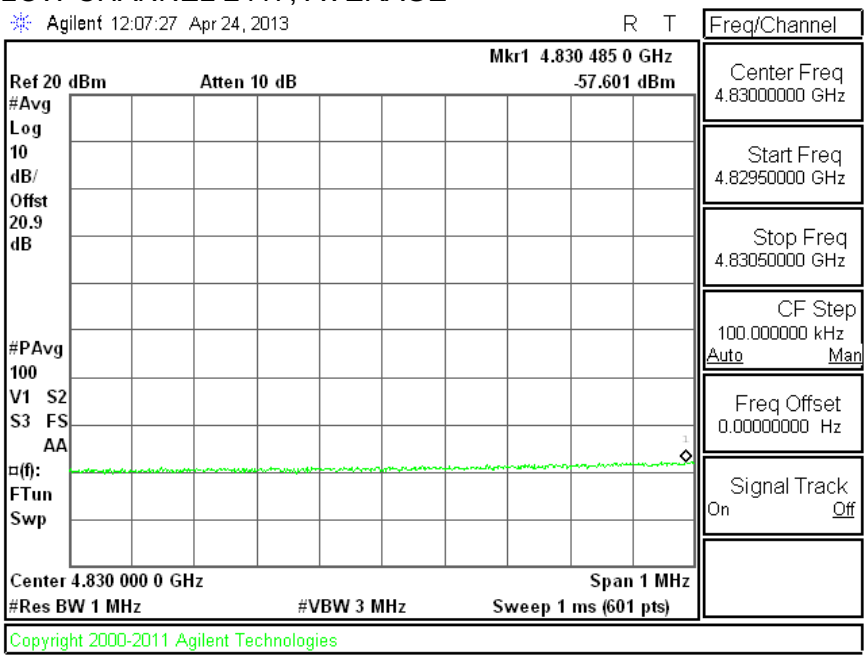
LOW CHANNEL 2417, PEAK



LOW CHANNEL 2417, AVERAGE



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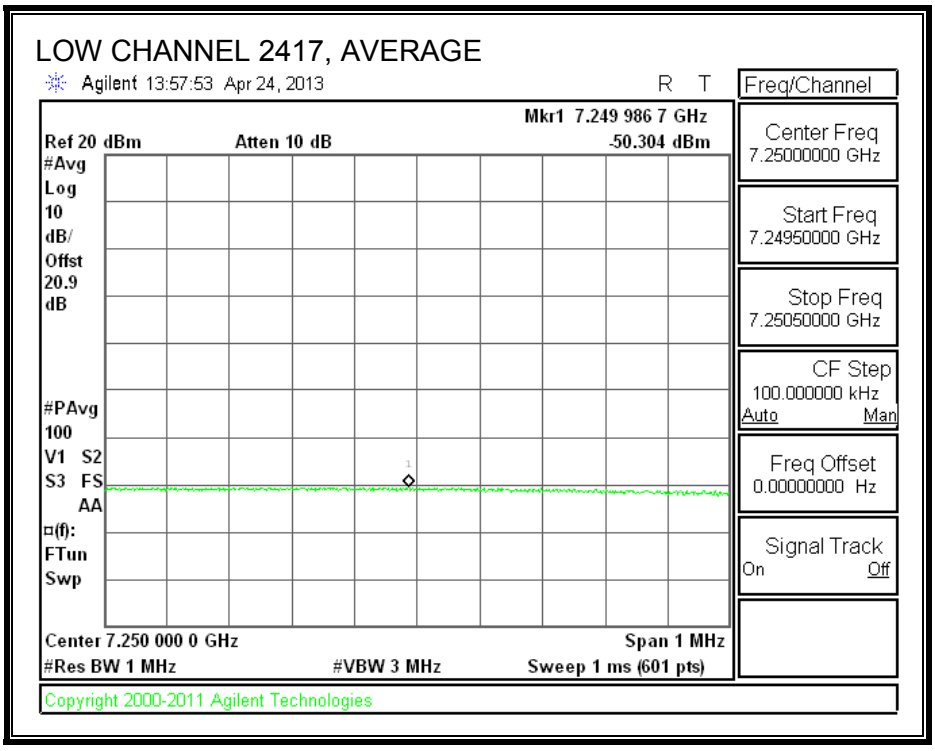

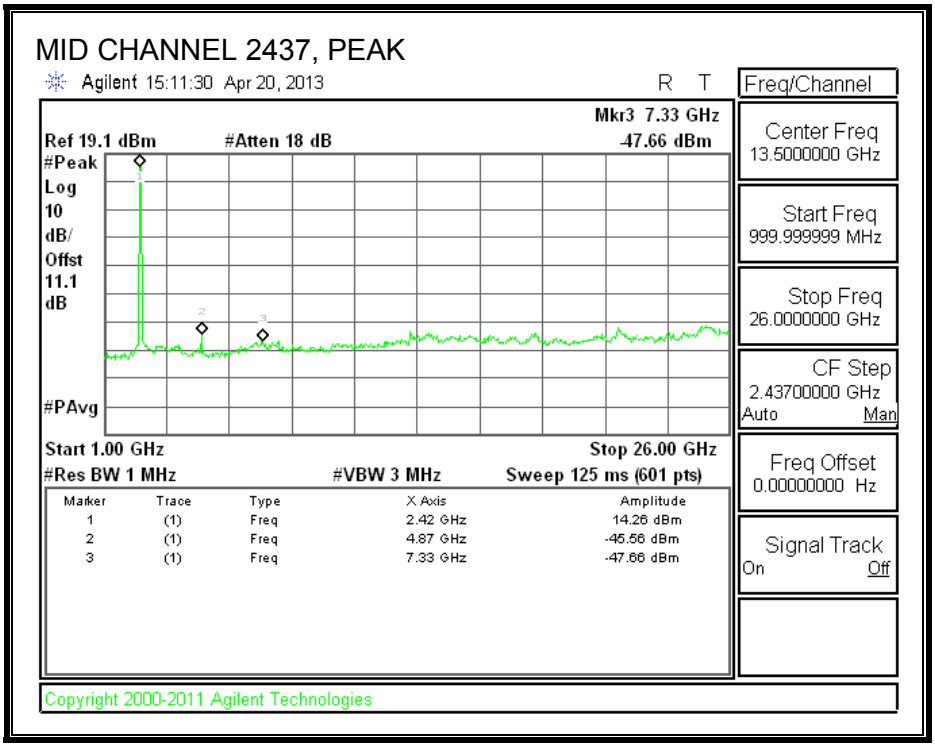

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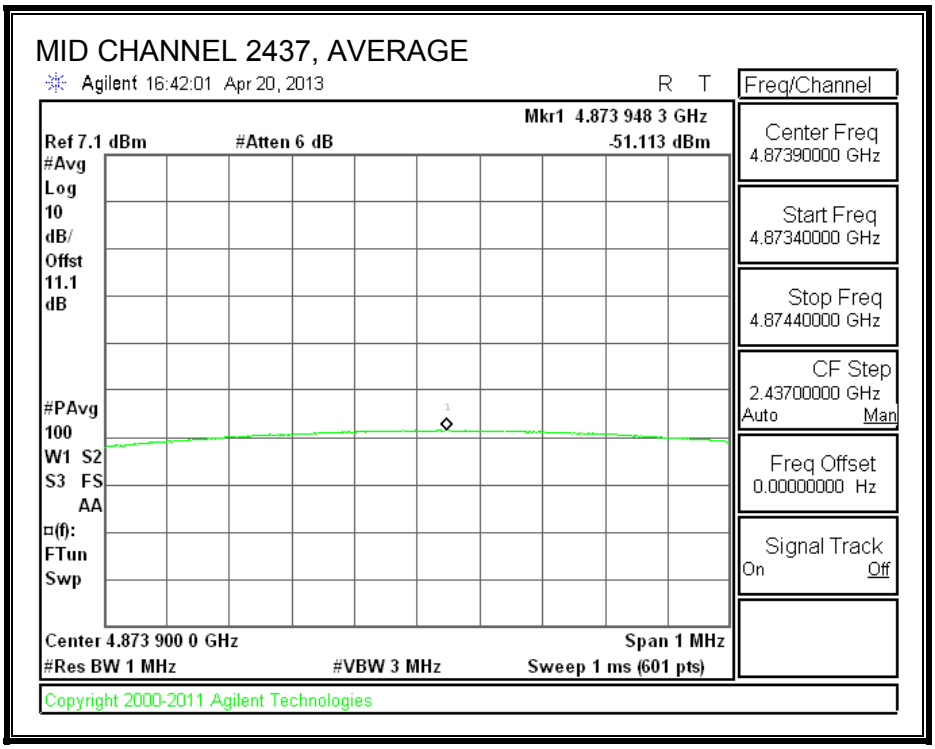

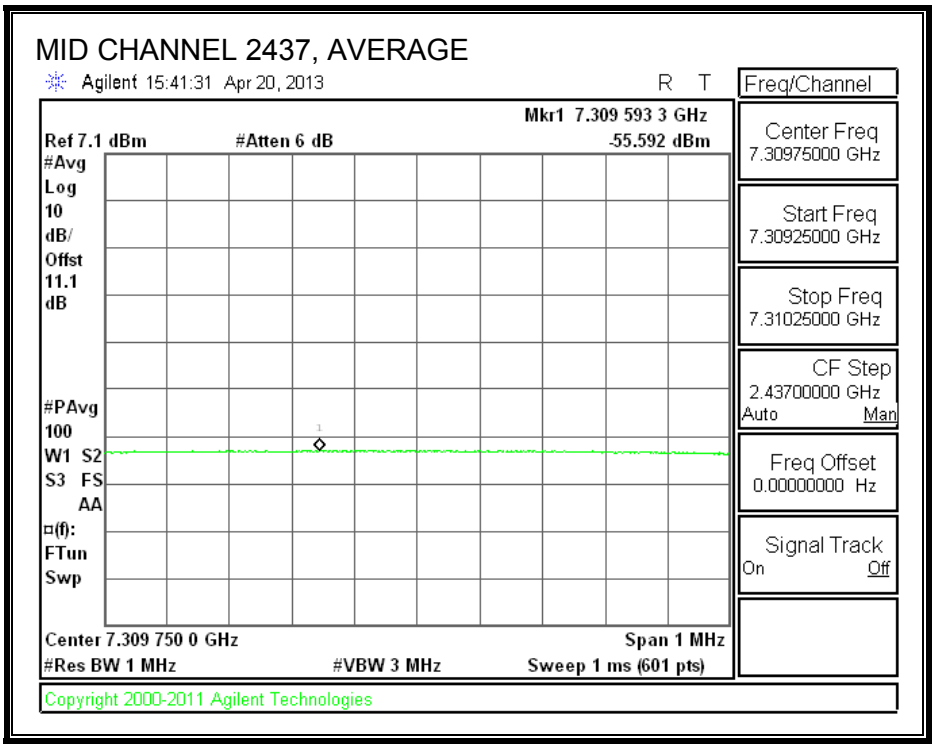

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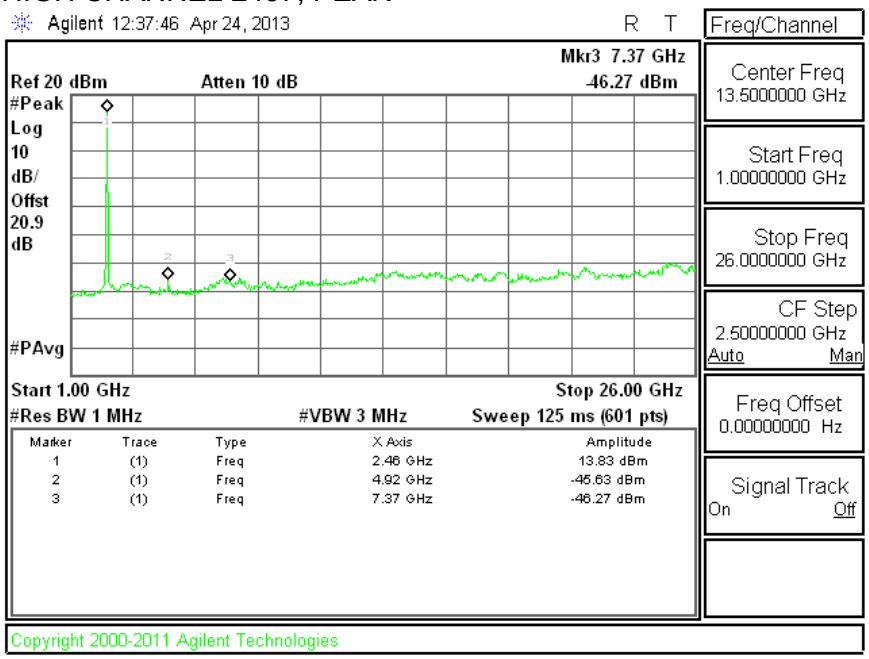
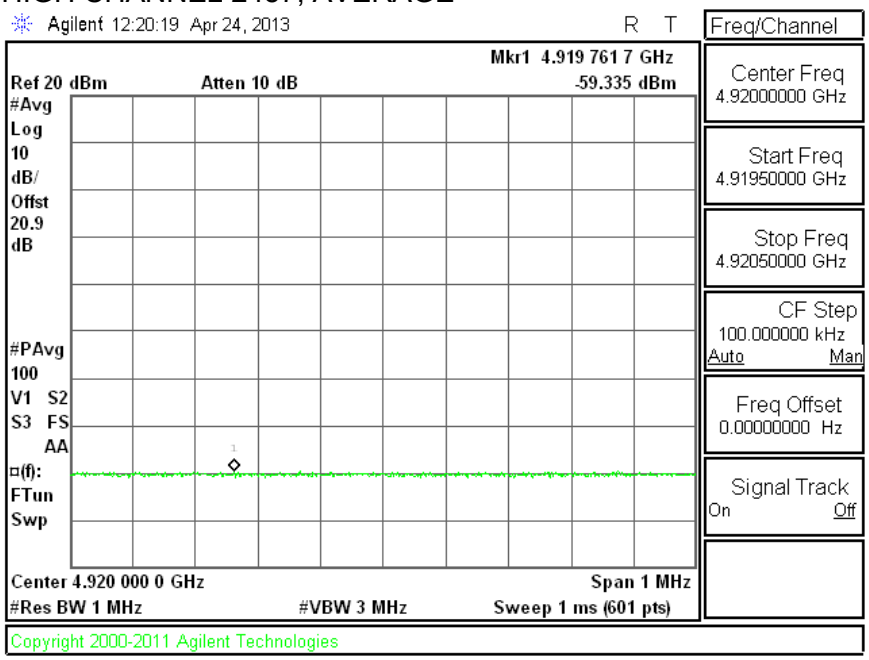
HIGH CHANNEL 2457, PEAK



HIGH CHANNEL 2457, AVERAGE



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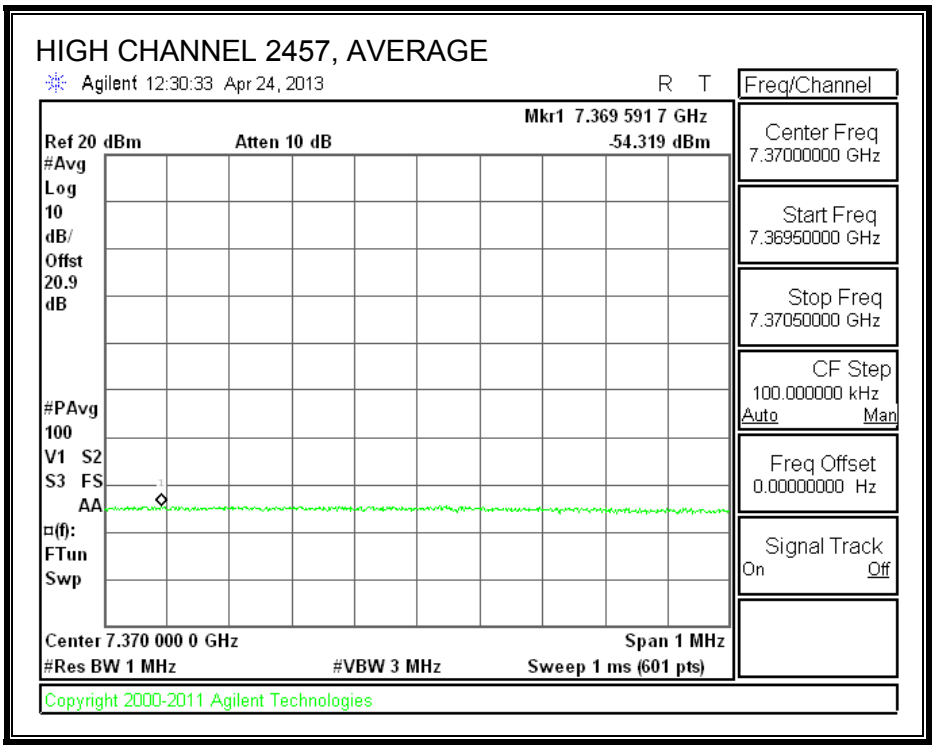
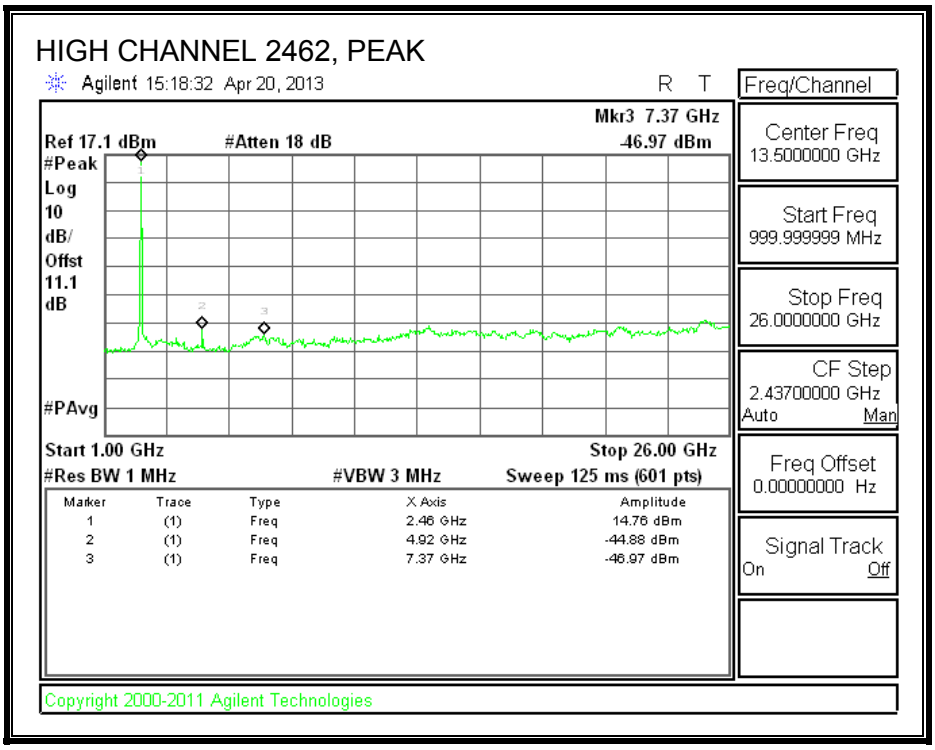
HIGH CHANNEL 2457, AVERAGE



HIGH CHANNEL 2462, PEAK



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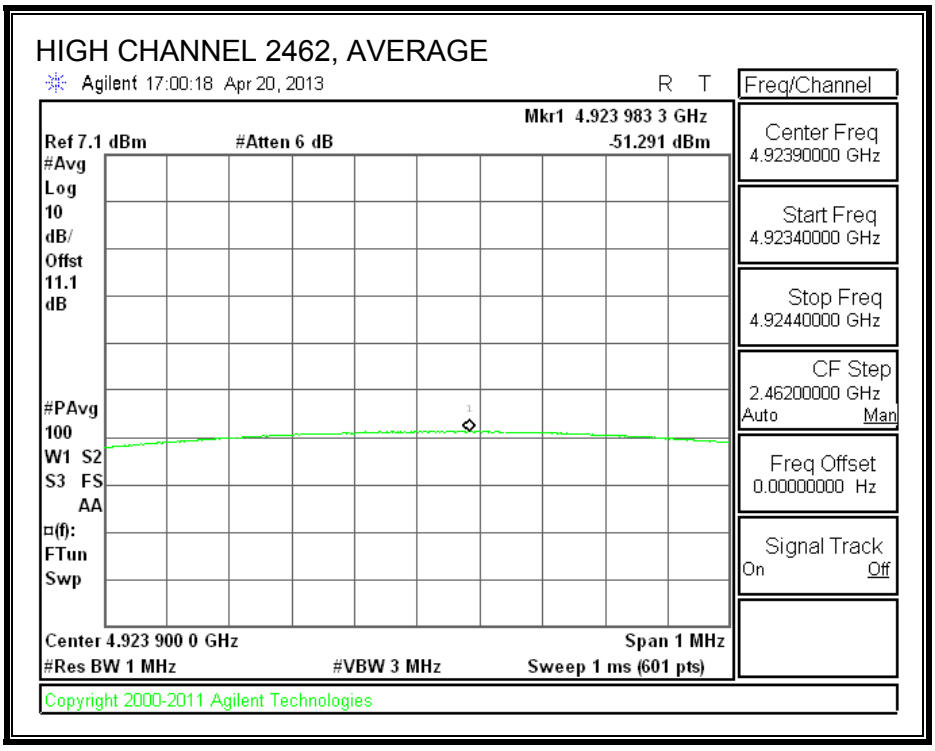

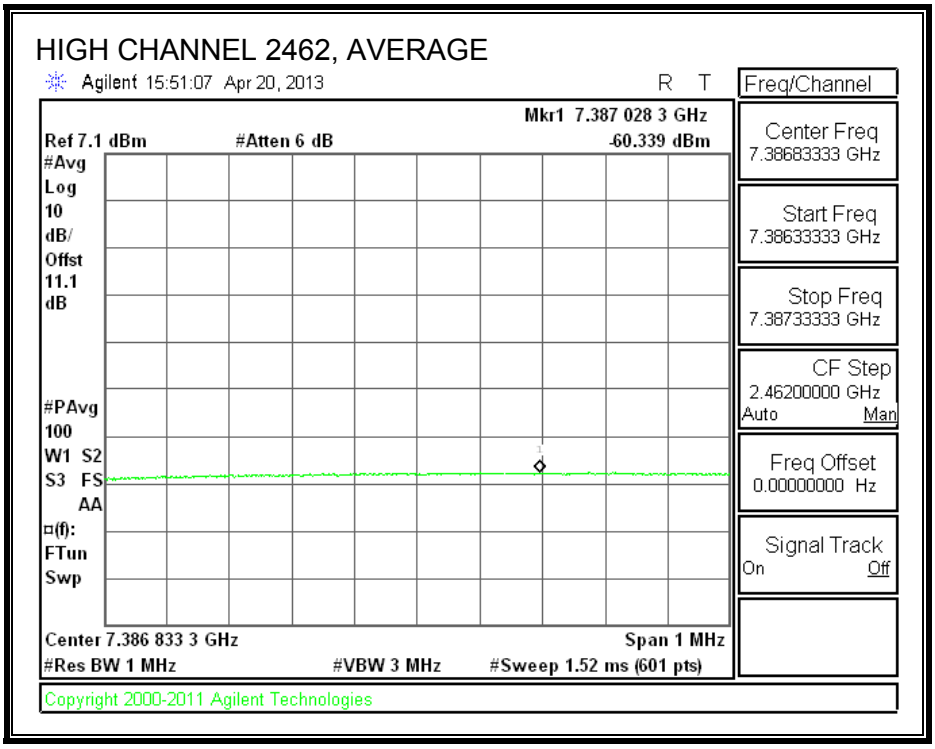

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BANDEDGE DATA

2TX Conducted Spurious BE for FCC DTS (in the restricted bands)

Date:	4/22/2013
Test Engineer:	Oliver Su
Client:	Qualcomm
Project Number:	13U14995
Configuration:	Tx
Mode of operation:	11b 2.4GHz

Note: if the PK margin is greater than 20 dB, there is no need to get AVG reading.

Channel	Frequency (MHz)	PXA PK Reading Chain 0 (dBm)	PXA PK Reading Chain 1 (dBm)	AG/Chain (dBi)	PK EIRP (dBm)	PK E-field Limit (dBm)	PK E-field Margin (dB)	Software Setting	AVG Power Meter Reading (dBm)
1 (2412)	2388	-41.99	-40.79	2	-33.33	-21.2	-12.13	18.50	17.8 / 18.0
2(2417)	2389	-44.37	-43.11	2	-35.67	-21.2	-14.47	18.00	18 / 18.1
10 (2457)	2484	-40.96	-43.24	2	-33.93	-21.2	-12.73	19.00	19 /18
11 (2462)	2487	-40.45	-42.26	2	-33.24	-21.2	-12.04	18.50	19.0 / 18.0

Channel	Frequency (MHz)	PXA AVG Reading Chain 0 (dBm)	PXA AVG Reading Chain 1 (dBm)	AG/Chain (dBi)	AVG EIRP (dBm)	AVG E-field Limit (dBm)	AVG E-field Margin (dB)	Software Setting	AVG Power Meter Reading (dBm)
1 (2412)	2390	-51.235	-51.425	2	-43.31	-41.2	-2.11	18.00	17.8 / 17.6
2(2417)	2390	-52.853	-49.974	2	-43.16	-41.2	-1.96	18.00	18 / 18.1
10 (2457)	2483	-49.718	-53.504	2	-43.19	-41.2	-1.99	19.00	19 / 18
11 (2462)	2483	-49.741	-51.425	2	-42.48	-41.2	-1.28	18.00	18.5 / 17.6

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SPURIOUS DATA

2TX Conducted Spurious for FCC DTS (in the restricted bands)

Date:	4/24/2013
Test Engineer:	Oliver Su / T. Wagoner
Client:	Qualcomm Atheros
Project Number:	13U14995
Configuration:	Tx
Mode of operation:	11b 2.4GHz

Note: if the PK margin is greater than 20 dB, there is no need to get AVG reading.

Channel	Frequency (MHz)	PSA PK Reading Chain 0 (dBm)	PSA PK Reading Chain 1 (dBm)	AG/Chain (dBi)	PK EIRP (dBm)	PK E-field Limit (dBm)	PK E-field Margin (dB)	Software Setting	AVG Power Meter Reading (dBm)
1 (2412)	4920	-42.34	-44.87	2	-35.40	-21.2	-14.20	19.00	19.4 / 19.6
1 (2412)	7370	-46.37	-43.49	2	-36.68	-21.2	-15.48	19.00	19.4 / 19.6
2 (2417)	4830	-44.26	-46.64	2	-37.27	-21.2	-16.07	19.00	18.3 / 18.32
2 (2417)	7250	-43.2	-46.79	2	-36.61	-21.2	-15.41	19.00	18.3 / 18.32
6 (2437)	4874	-43.24	-45.56	2	-36.23	-21.2	-15.03	19.00	20.1 / 19.3
6 (2437)	7311	-45.13	-47.66	2	-38.19	-21.2	-16.99	19.00	20.1 / 19.3
10 (2457)	4920	-43.57	-45.63	2	-36.46	-21.2	-15.26	19.00	19 / 18
10 (2457)	7370	-44.56	-46.27	2	-37.31	-21.2	-16.11	19.00	19 / 18
11 (2462)	4924	-42.72	-44.88	2	-35.65	-21.2	-14.45	19.00	20.3 / 19.3
11 (2462)	7374	-47.22	-46.97	2	-39.07	-21.2	-17.87	19.00	20.3 / 19.3

Channel	Frequency (MHz)	PSA AVG Reading Chain 0 (dBm)	PSA AVG Reading Chain 1 (dBm)	AG/Chain (dBi)	AVG EIRP (dBm)	AVG E-field Limit (dBm)	AVG E-field Margin (dB)	Software Setting	AVG Power Meter Reading (dBm)
1 (2412)	4823	-50.367	-49.499	2	-41.89	-40.2	-1.69	18.50	18.8 / 19.1
1 (2412)	7370	-50.135	-49.475	2	-41.77	-41.2	-0.57	19.00	19.4 / 19.6
2 (2417)	4830	-56.913	-57.601	2	-49.22	-41.2	-8.02	18.00	18.3 / 18.32
2 (2417)	7250	-52.036	-50.304	2	-43.06	-41.2	-1.86	18.00	18 / 18.1
6 (2437)	4874	-49.372	-51.113	2	-42.14	-41.2	-0.94	17.50	18.7 / 17.8
6 (2437)	7311	-52.118	-55.592	2	-45.50	-41.2	-4.30	19.00	20.1 / 19.3
10 (2457)	4920	-59.01	-59.335	2	-51.15	-41.2	-9.95	19.00	19 / 18
10 (2457)	7370	-52.539	-54.319	2	-45.32	-41.2	-4.12	19.00	19 / 18
11 (2462)	4924	-49.227	-51.291	2	-42.12	-41.2	-0.92	17.00	18.5 / 17.4
11 (2462)	7374	-55.048	-60.339	2	-48.91	-41.2	-7.71	19.00	20.3 / 19.3

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8.2. 802.11g MODE IN THE 2.4 GHz BAND

8.2.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	2412	16.460	16.540	0.5
Low	2417	16.500	16.540	0.5
Mid	2437	16.460	16.580	0.5
High	2457	16.540	16.500	0.5
High	2462	16.540	16.500	0.5

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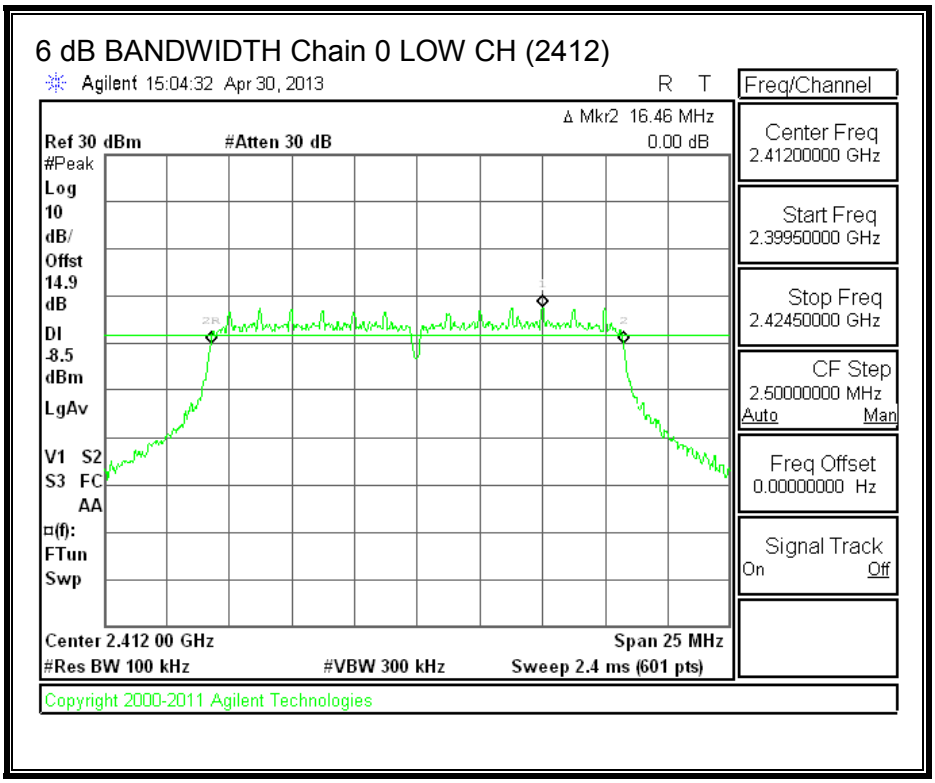
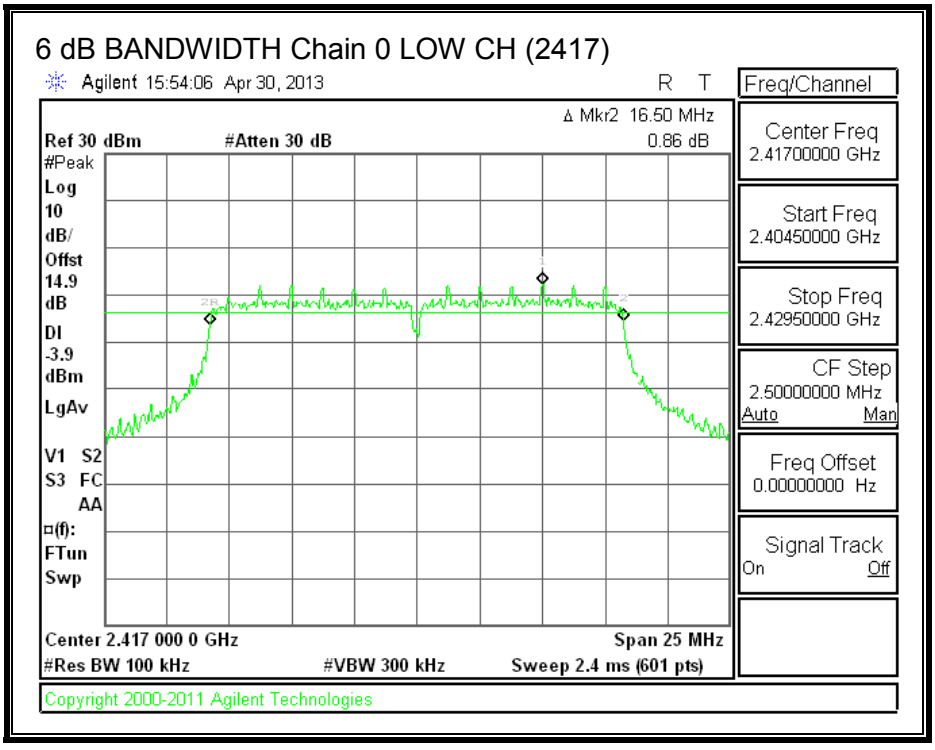
6 dB BANDWIDTH, Chain 0





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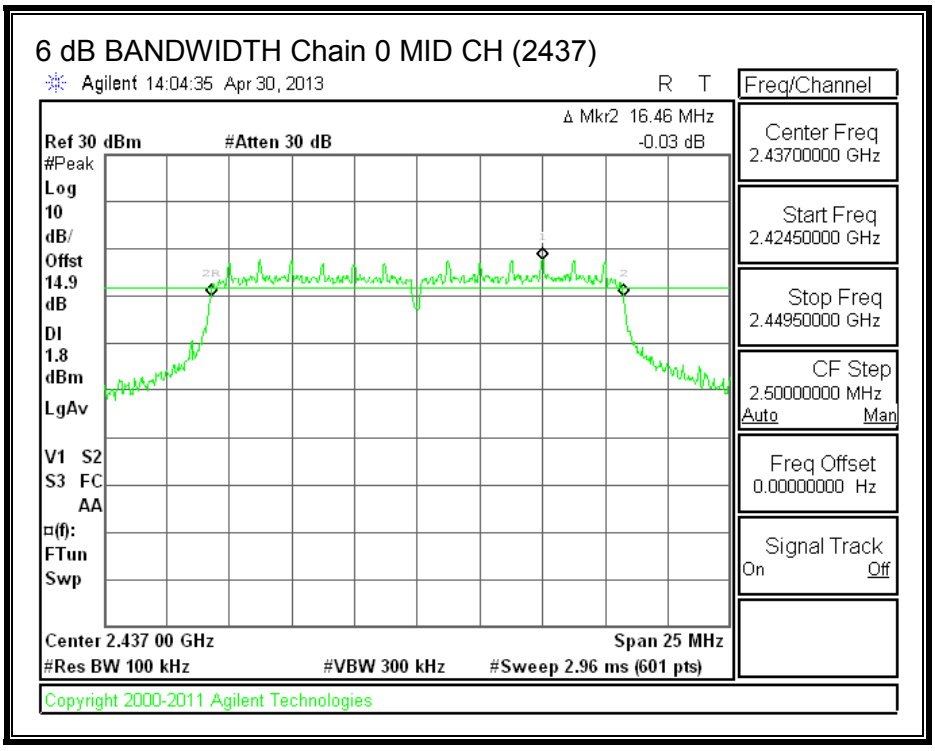

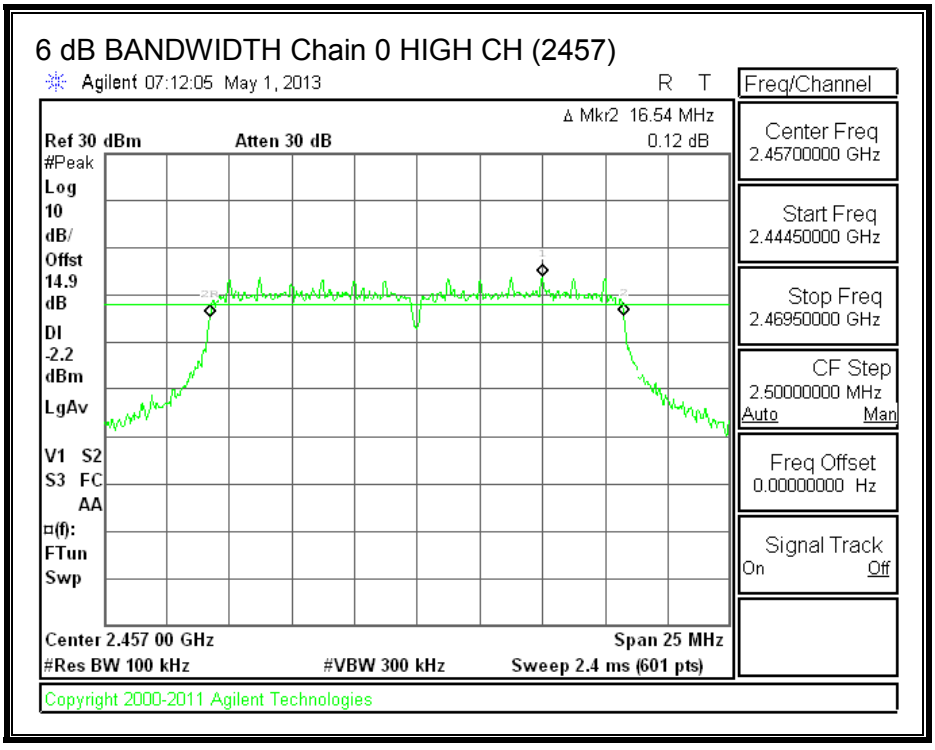

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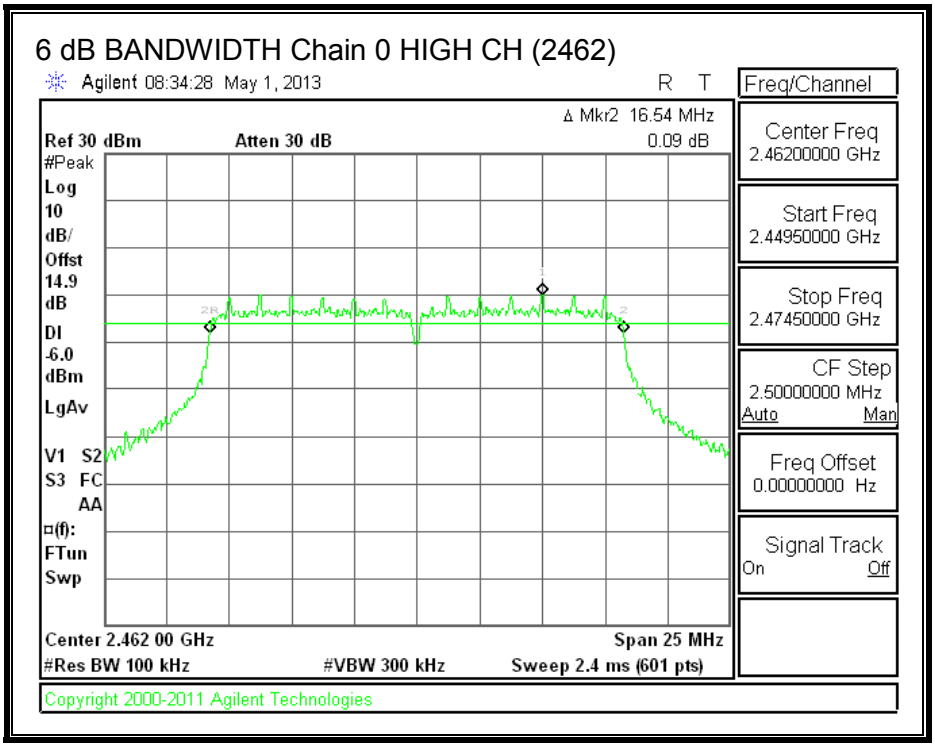
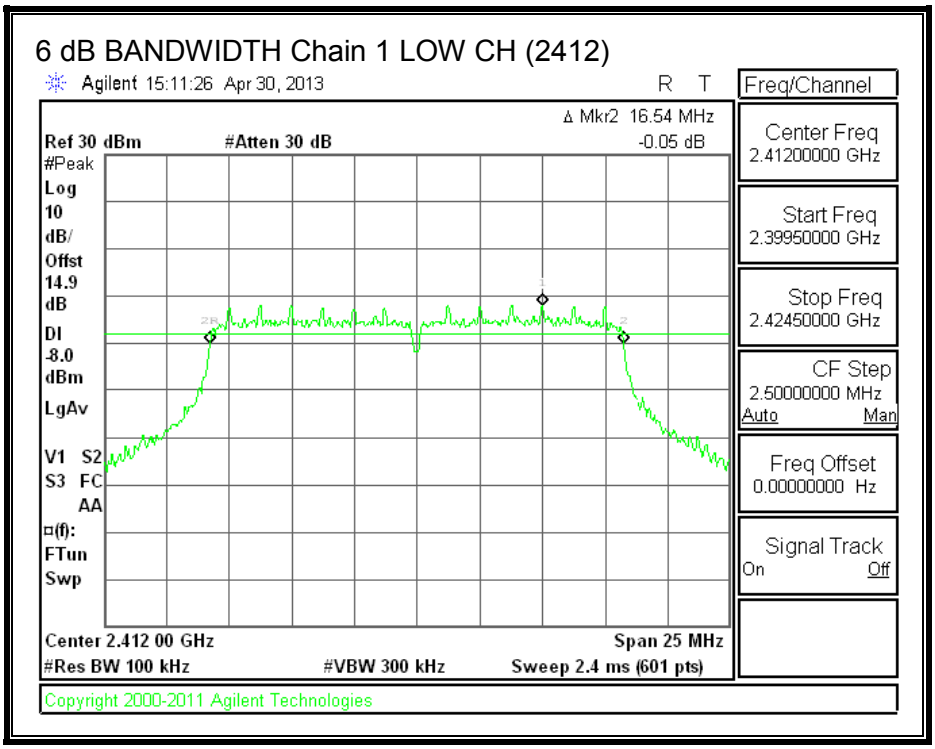


6 dB BANDWIDTH, Chain 1



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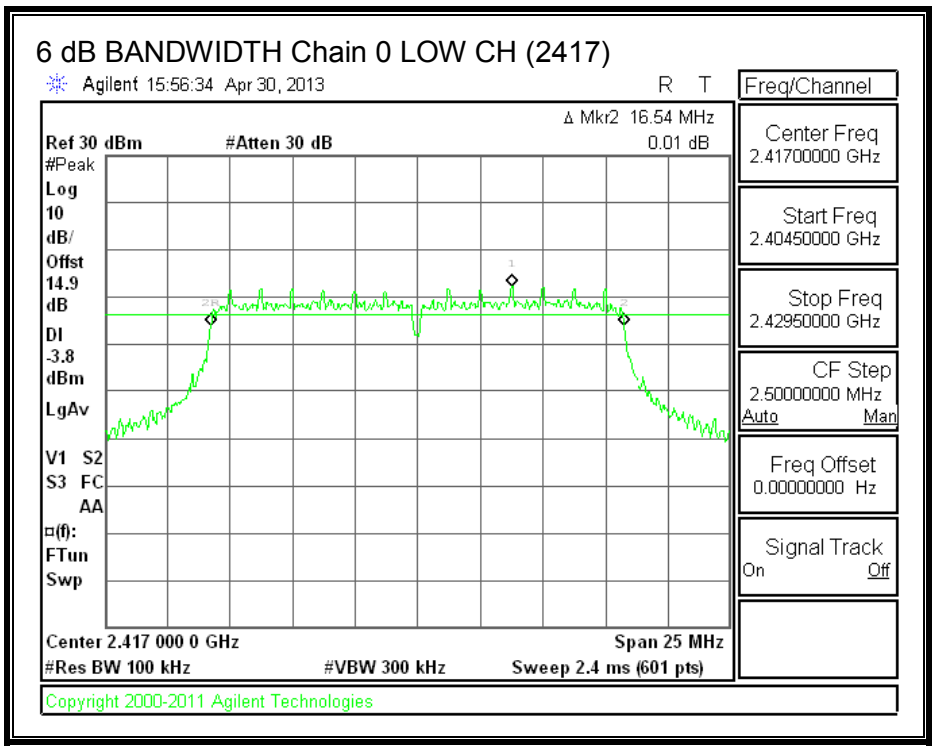

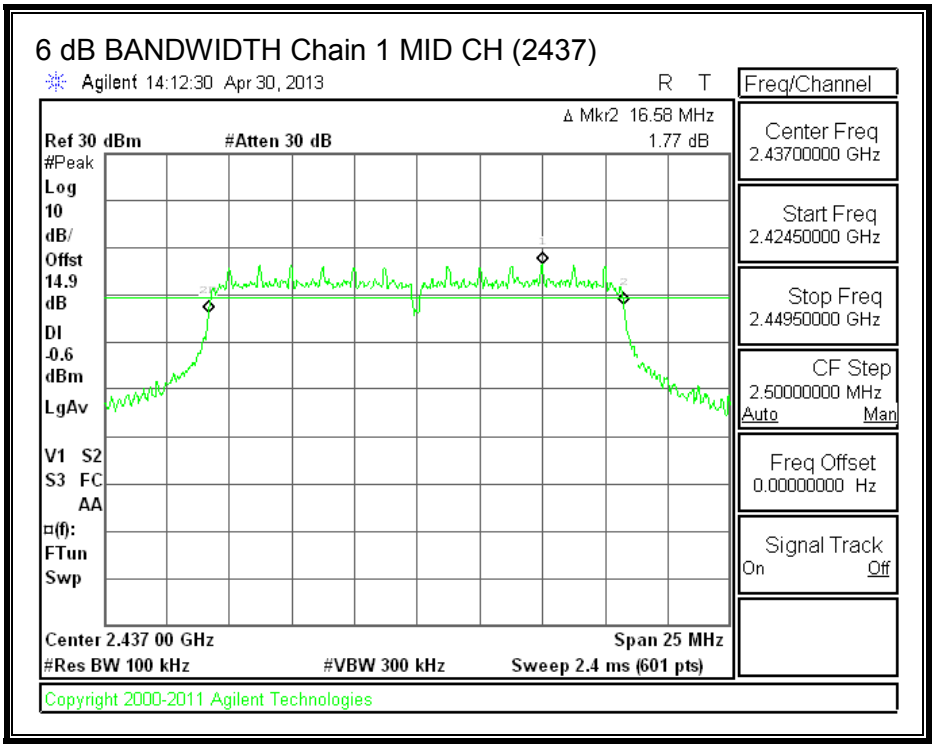

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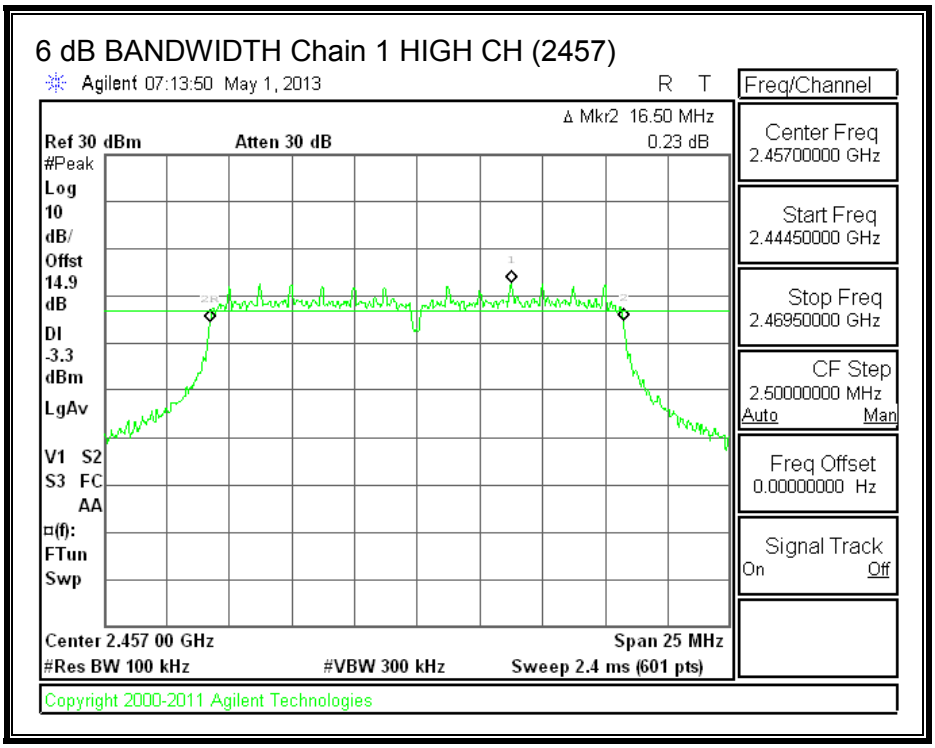

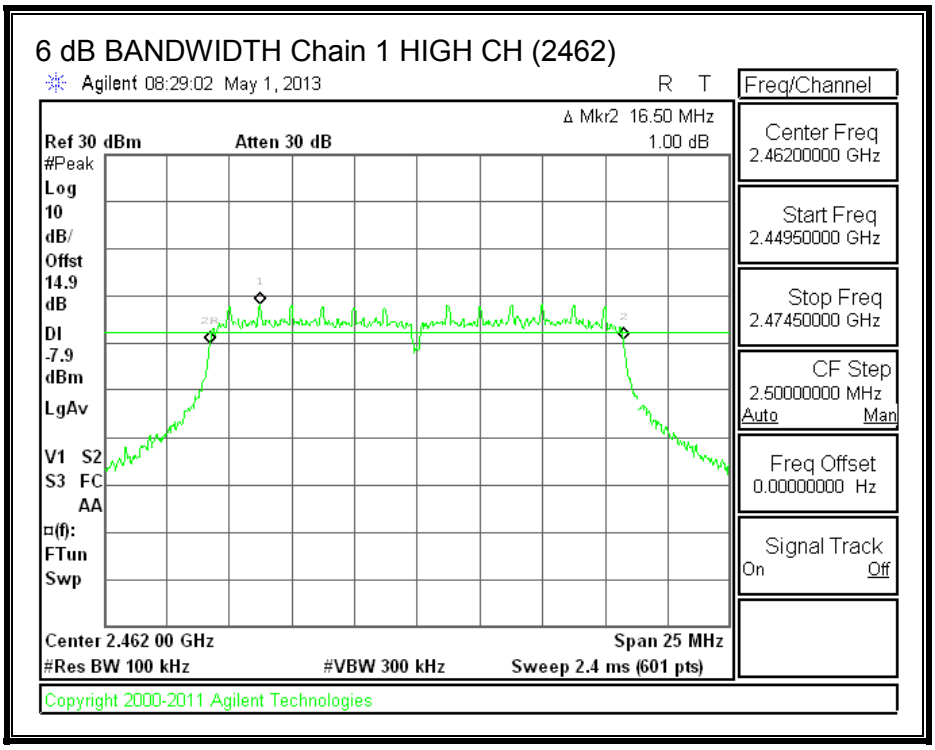

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8.2.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	2412	16.5478	16.4422
Low	2417	16.5540	16.5913
Mid	2437	16.5554	16.5923
High	2457	16.5542	16.5382
High	2462	16.5072	16.5612

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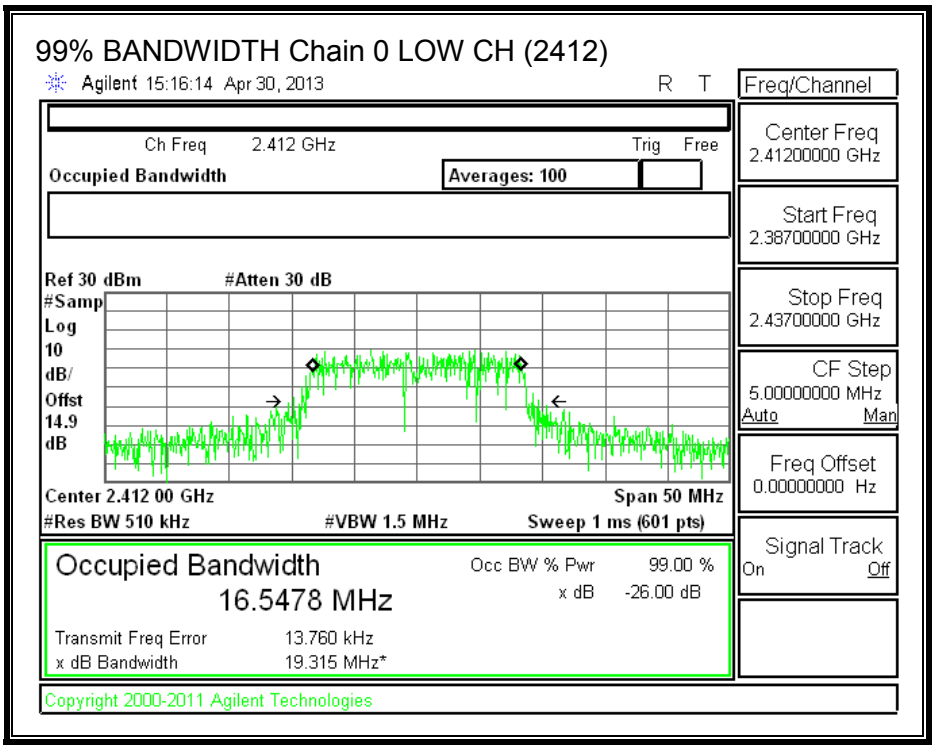
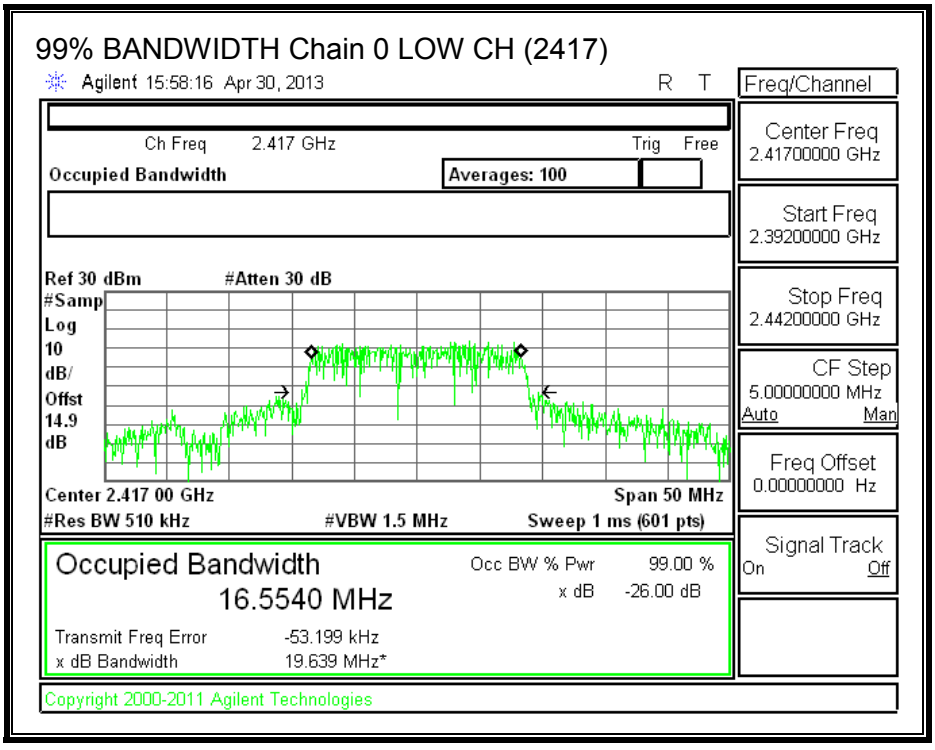
99% BANDWIDTH, Chain 0





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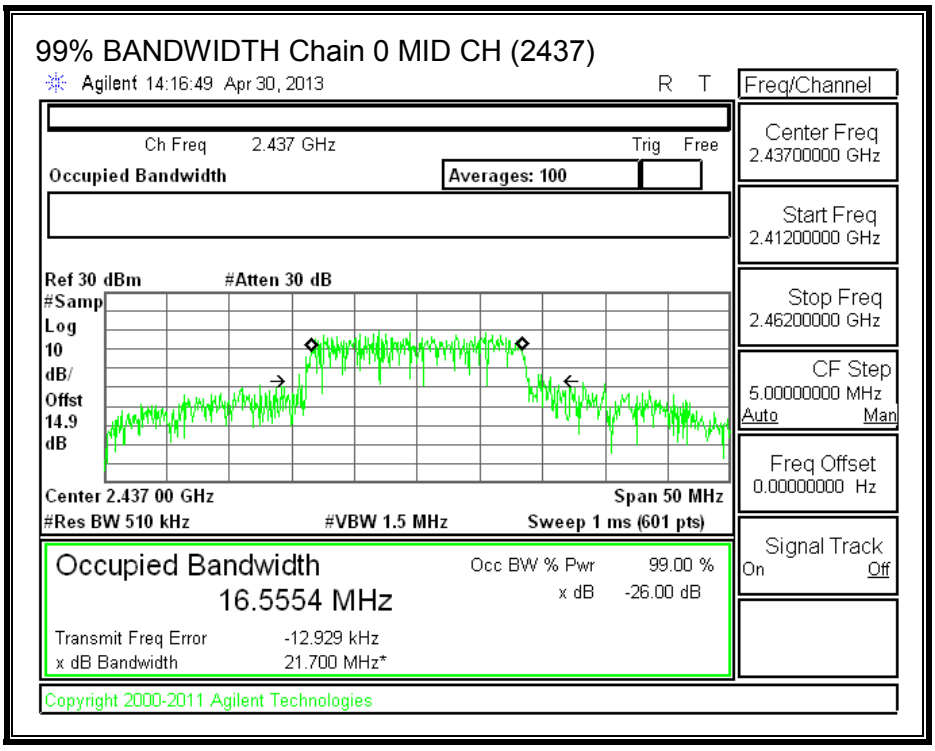

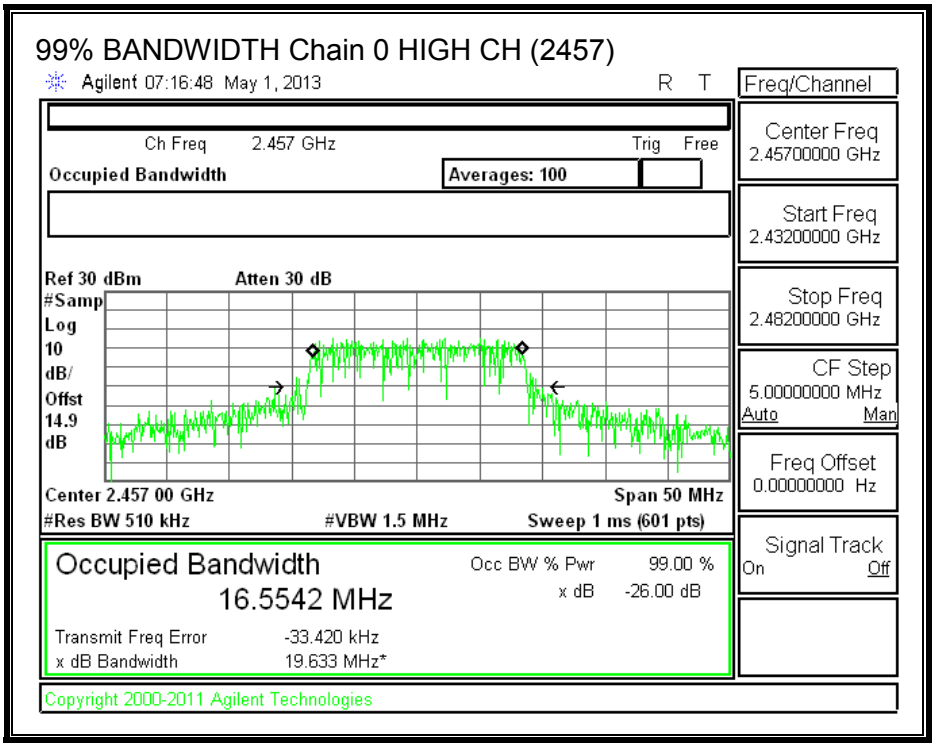

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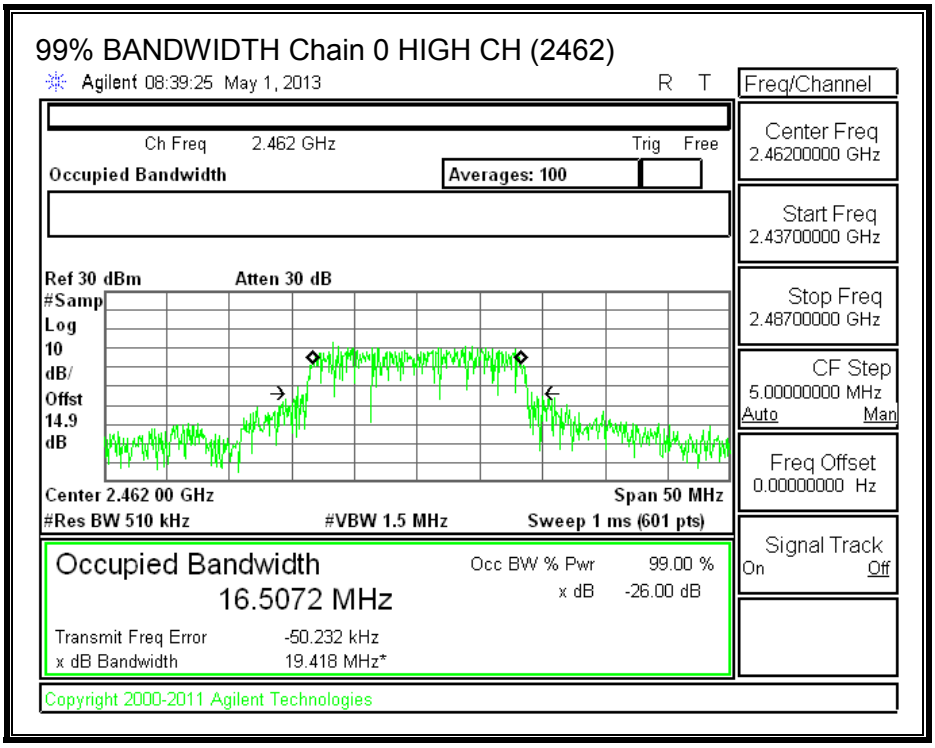
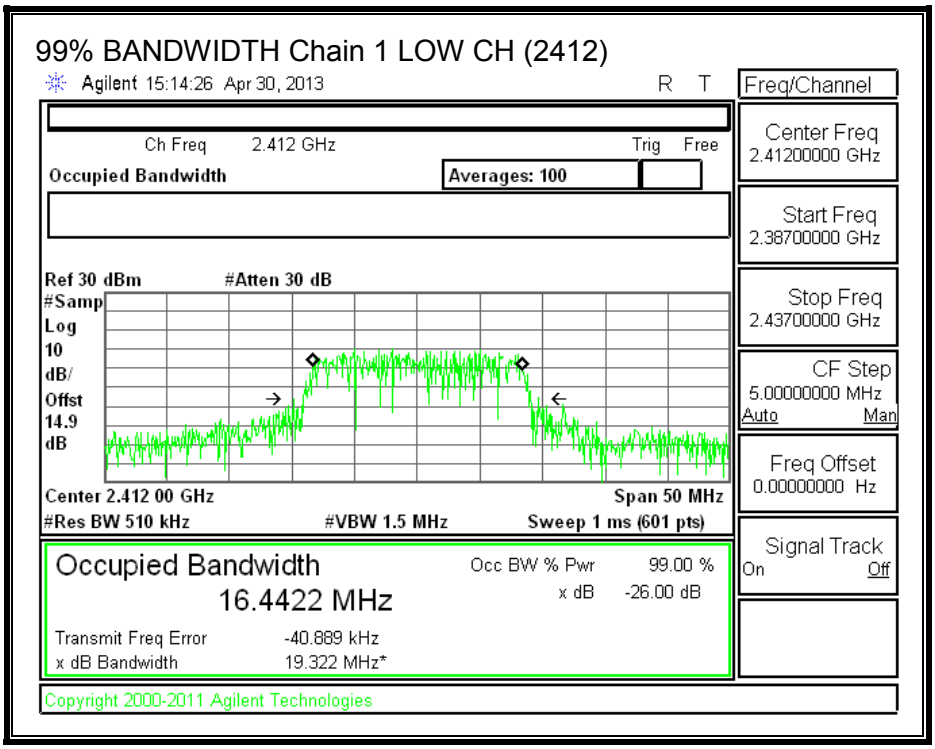


99% BANDWIDTH, Chain 1



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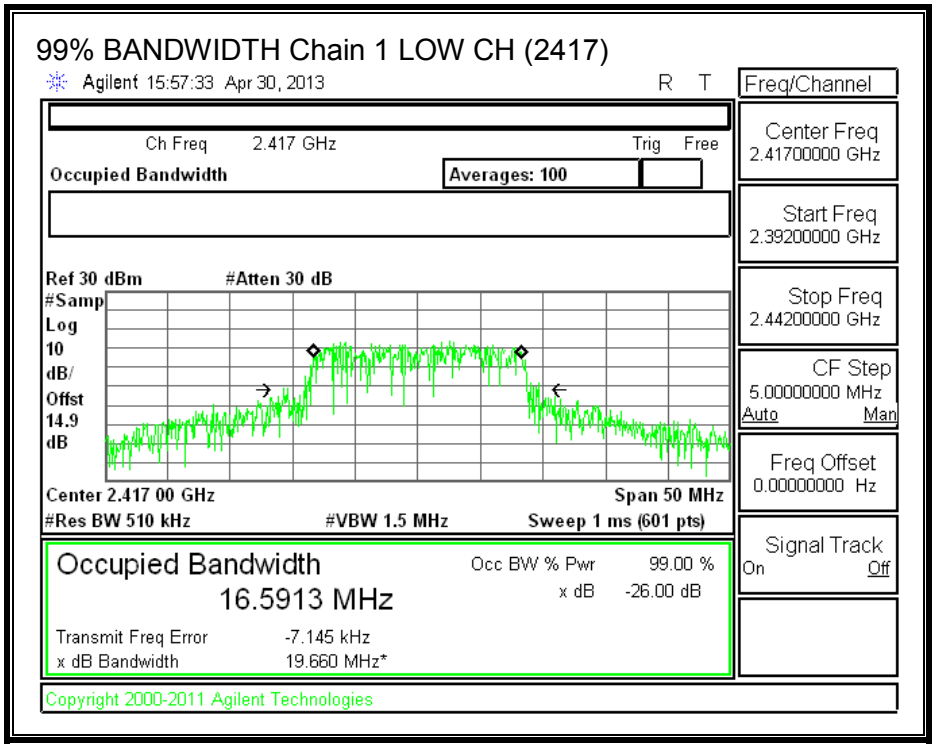

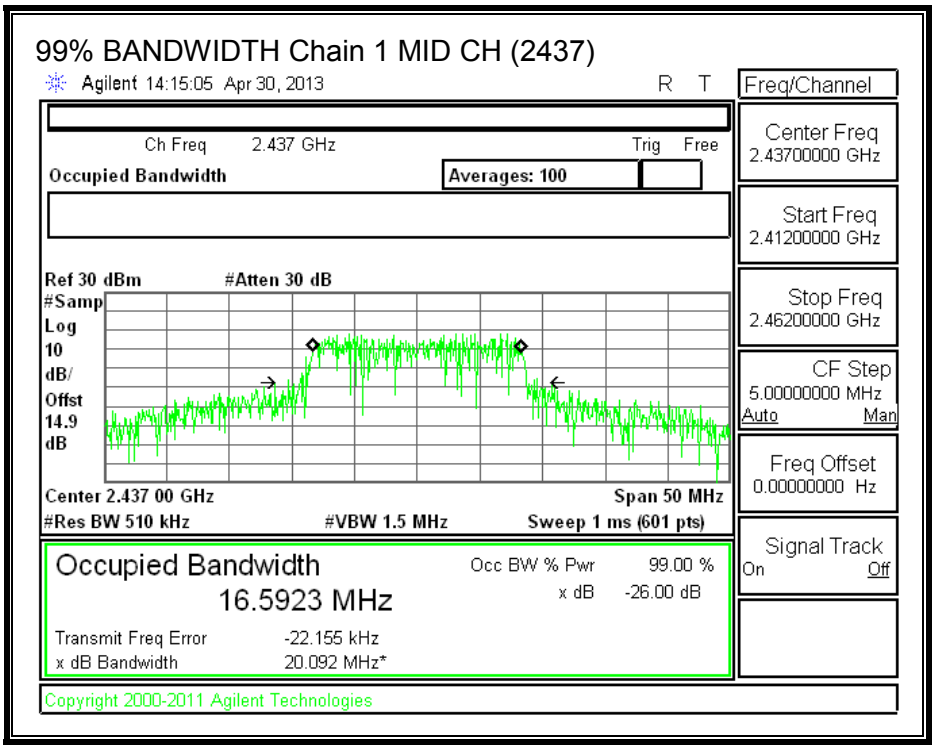

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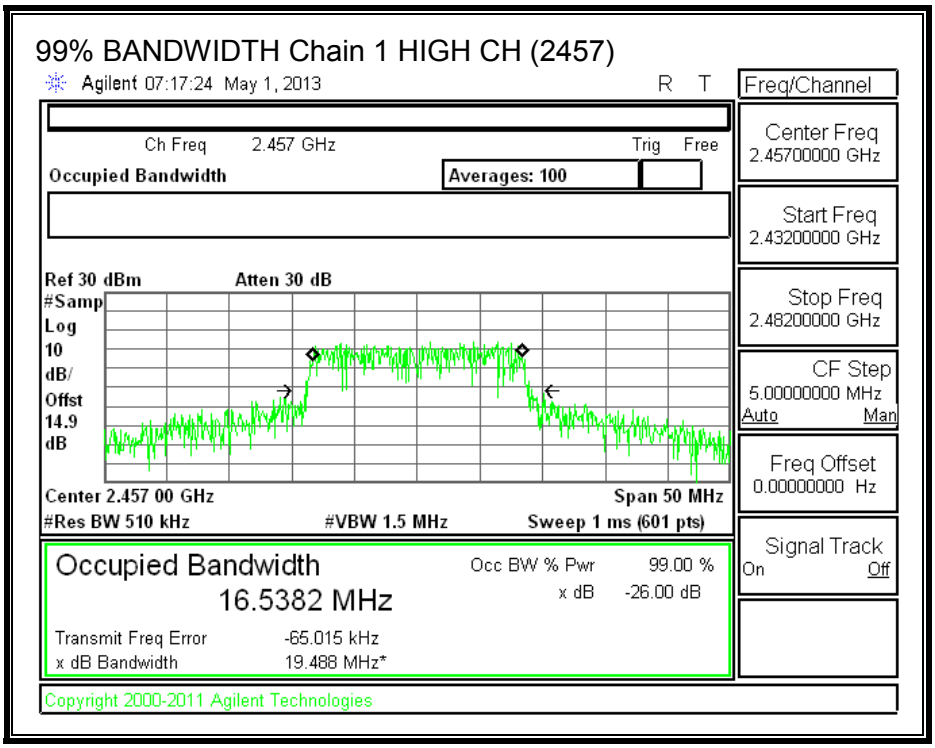

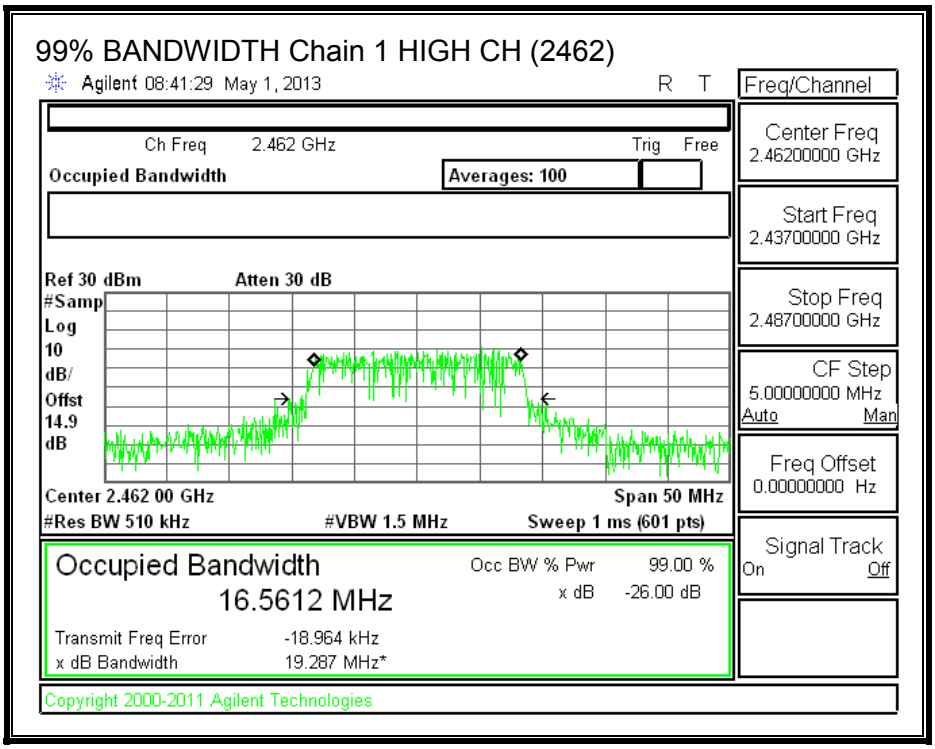

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8.2.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 14.88 dB (including 10 dB pad, power splitter 3.4 dB, and 1.48 cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	2412	10.10	9.10	12.64
Low	2417	13.15	13.40	16.29
Mid	2437	18.70	17.60	21.20
High	2457	14.50	12.80	16.74
High	2462	9.30	8.70	12.02

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8.2.4. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is the same for each chain. The directional gain is equal to the antenna gain.

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
2.00	2.00	2.00

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RESULTS

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	2.00	30.00	30	36	30.00
Low	2417	2.00	30.00	30	36	30.00
Mid	2437	2.00	30.00	30	36	30.00
High	2457	2.00	30.00	30	36	30.00
High	2462	2.00	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	16.35	16.89	19.64	30.00	-10.36
Low	2417	20.84	21.10	23.98	30.00	-6.02
Mid	2437	26.30	25.36	28.87	30.00	-1.13
High	2457	22.86	21.18	25.11	30.00	-4.89
High	2462	18.95	16.90	21.06	30.00	-8.94

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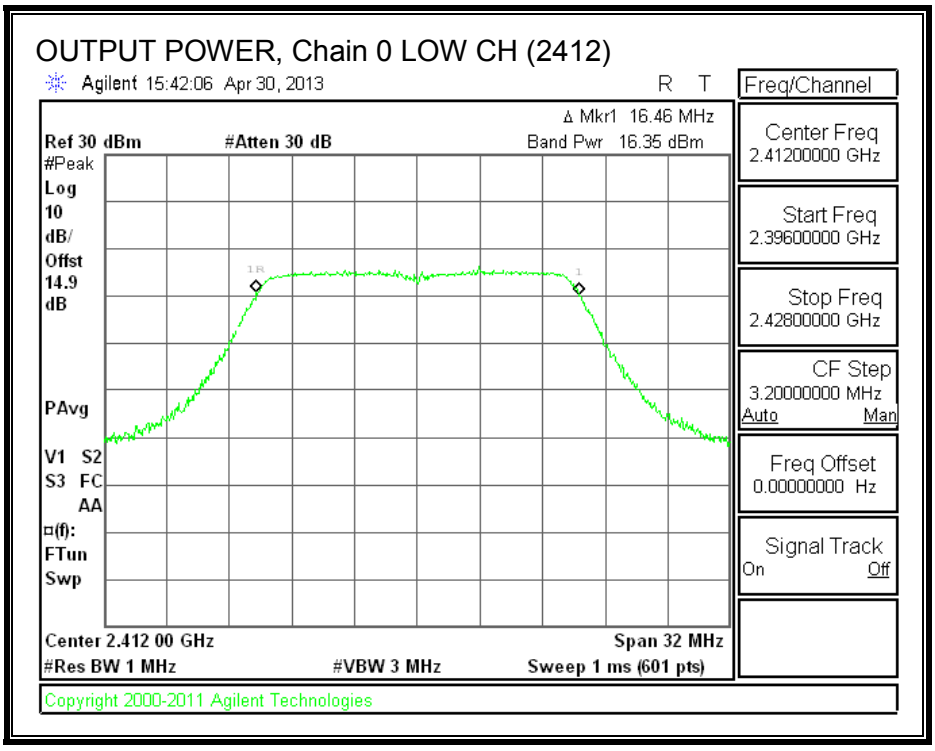
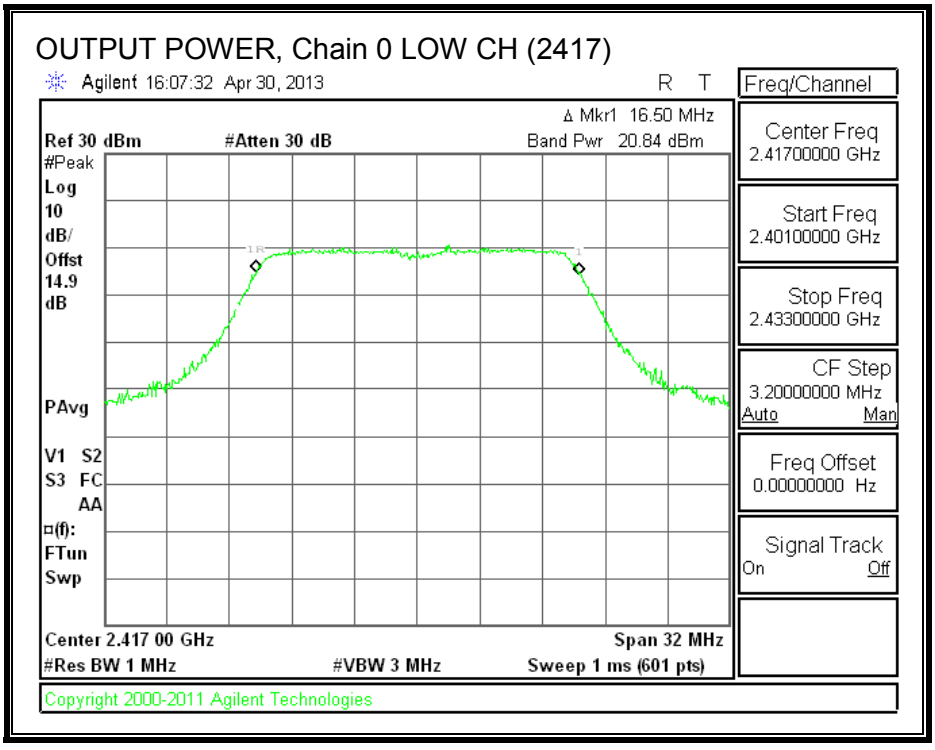
OUTPUT POWER, Chain 0





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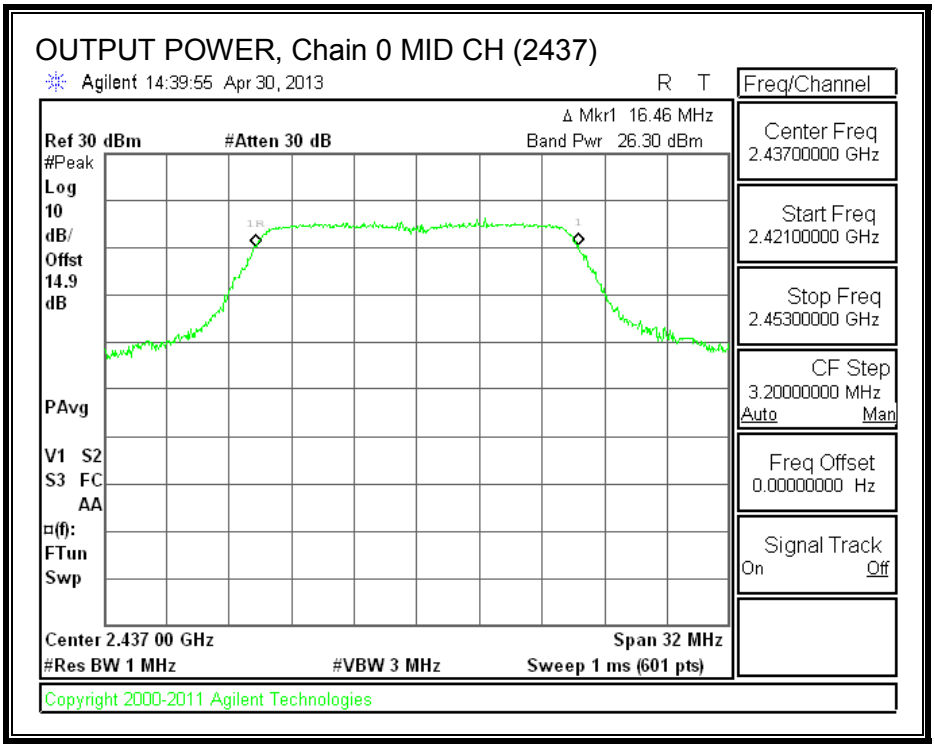
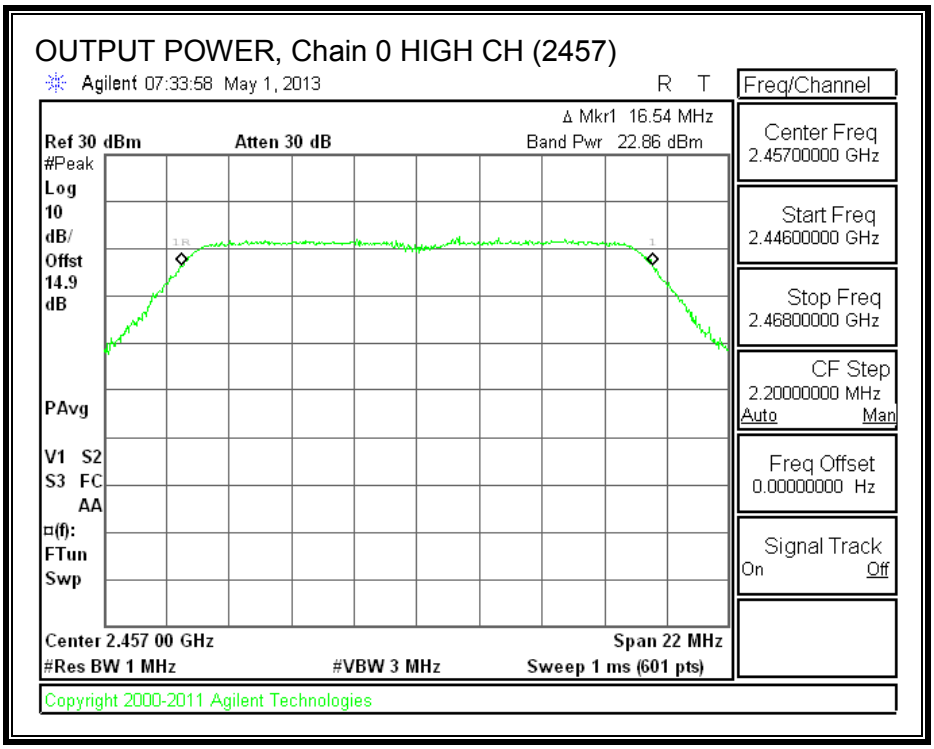
OUTPUT POWER, Chain 0 MID CH (2437)



OUTPUT POWER, Chain 0 HIGH CH (2457)



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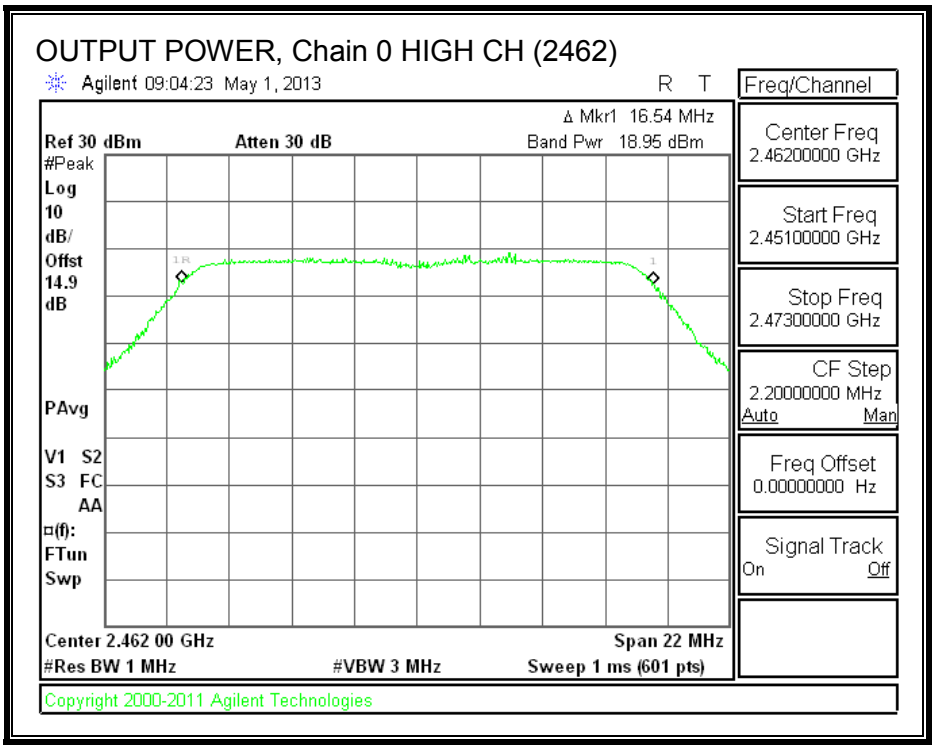
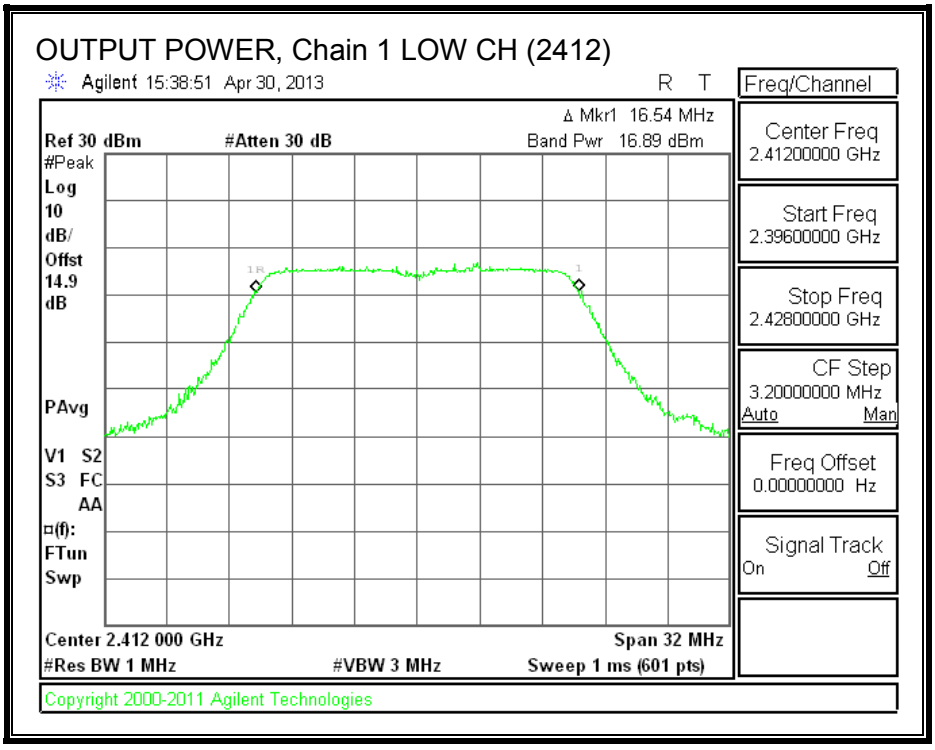


OUTPUT POWER, Chain 1



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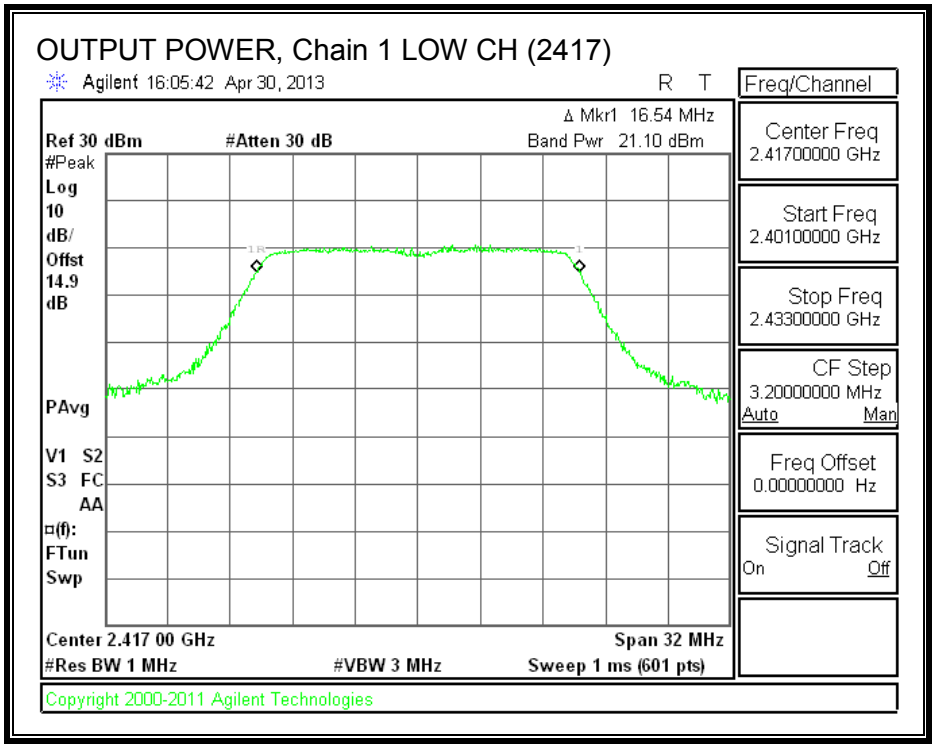

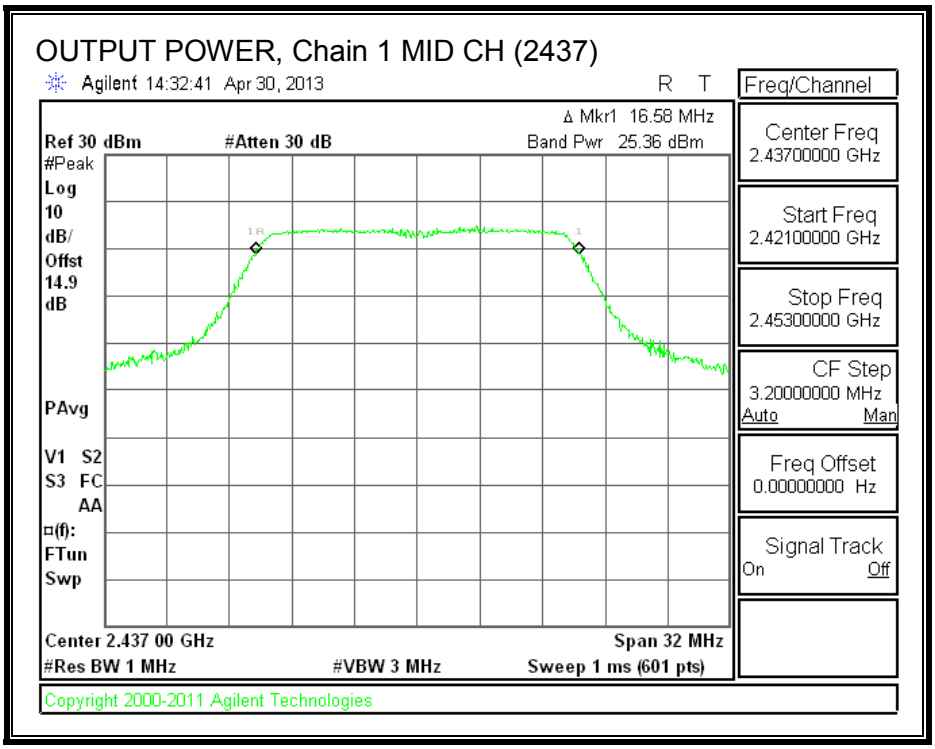

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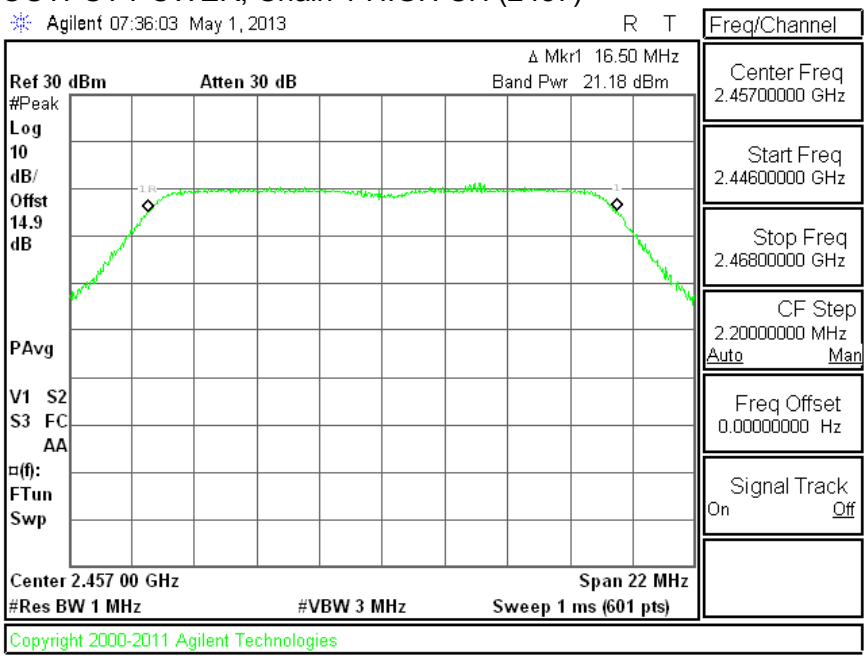
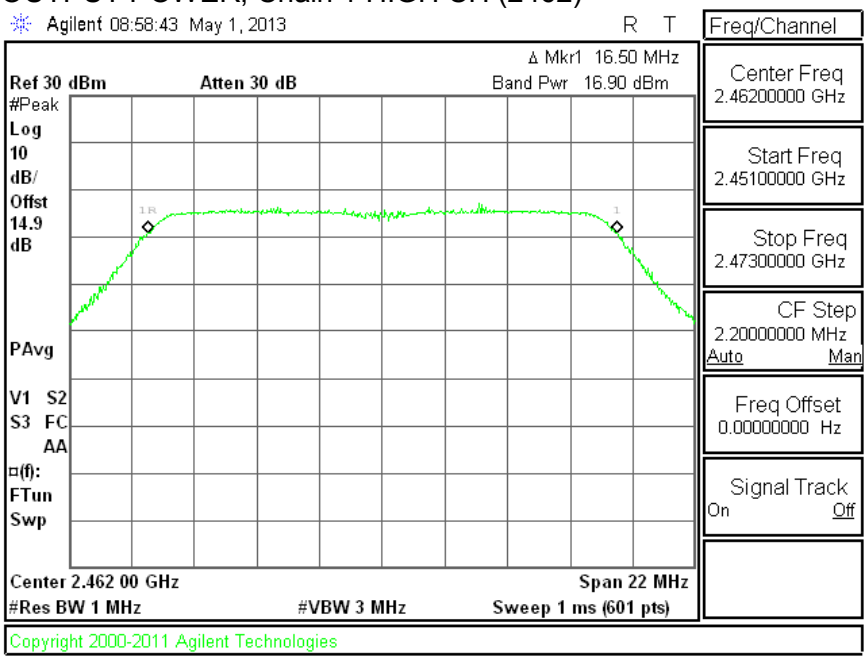
OUTPUT POWER, Chain 1 HIGH CH (2457)



OUTPUT POWER, Chain 1 HIGH CH (2462)



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8.2.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247

IC RSS-210 A8.2

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Chain 1 Meas (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-17.05	-15.98	-13.47	8.0	-21.5
Low	2417	-11.62	-11.53	-8.56	8.0	-16.6
Mid	2437	-6.93	-6.82	-3.86	8.0	-11.9
High	2457	-9.68	-10.87	-7.22	8.0	-15.2
High	2462	-13.77	-16.61	-11.95	8.0	-20.0

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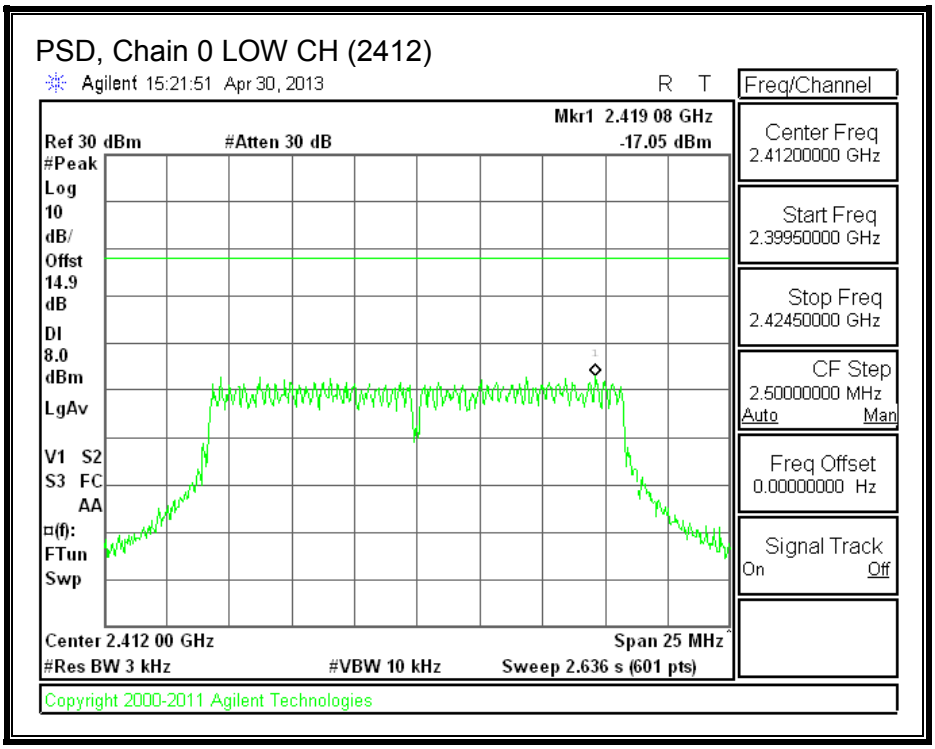
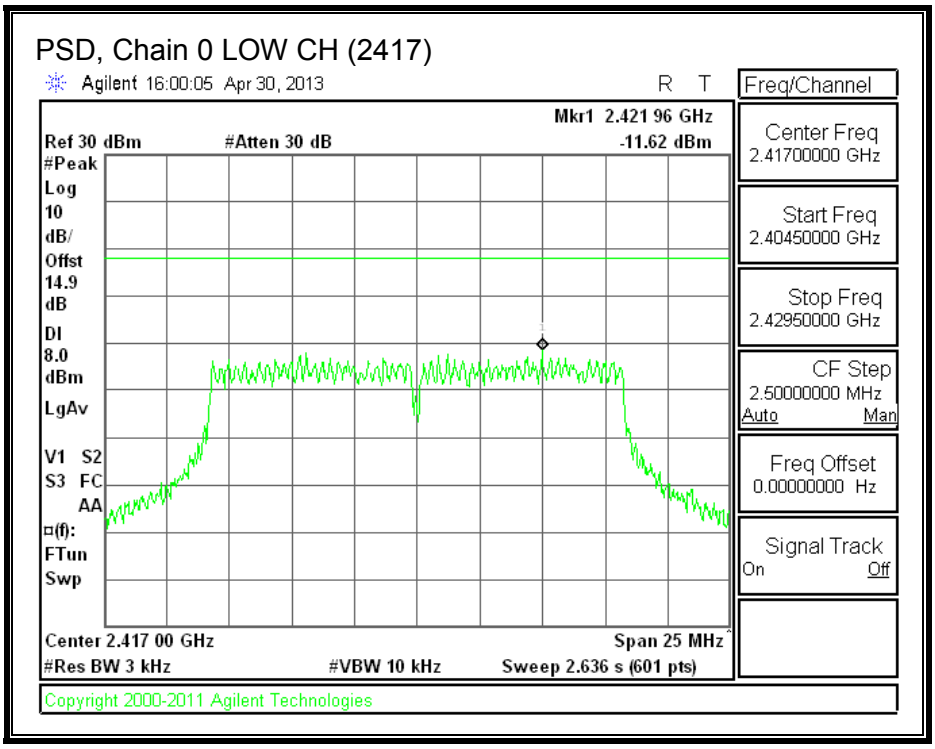
PSD, Chain 0





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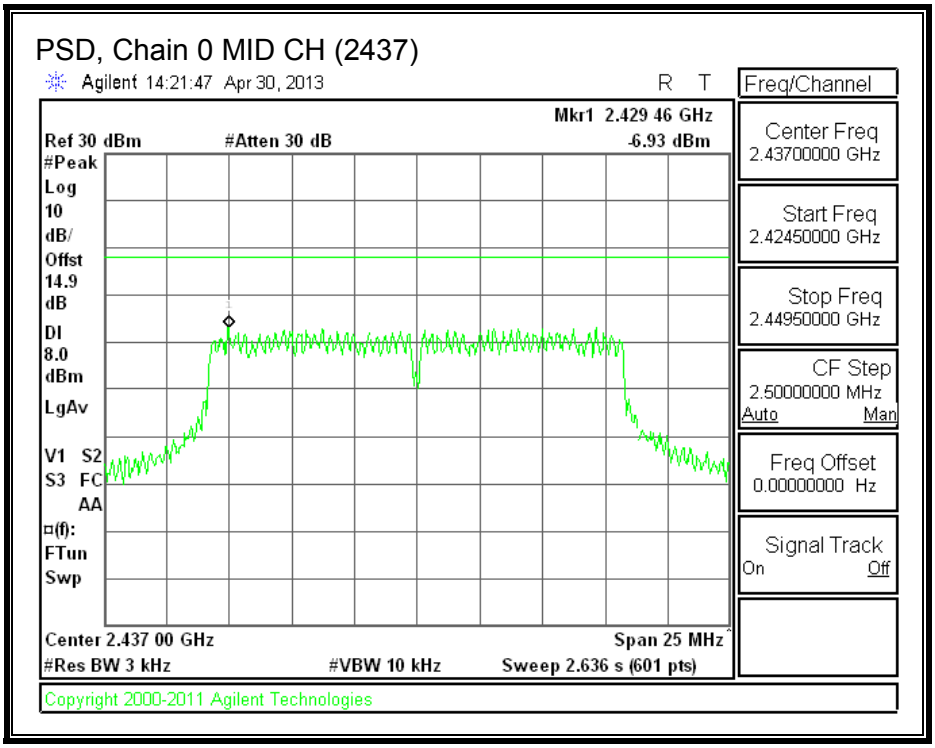
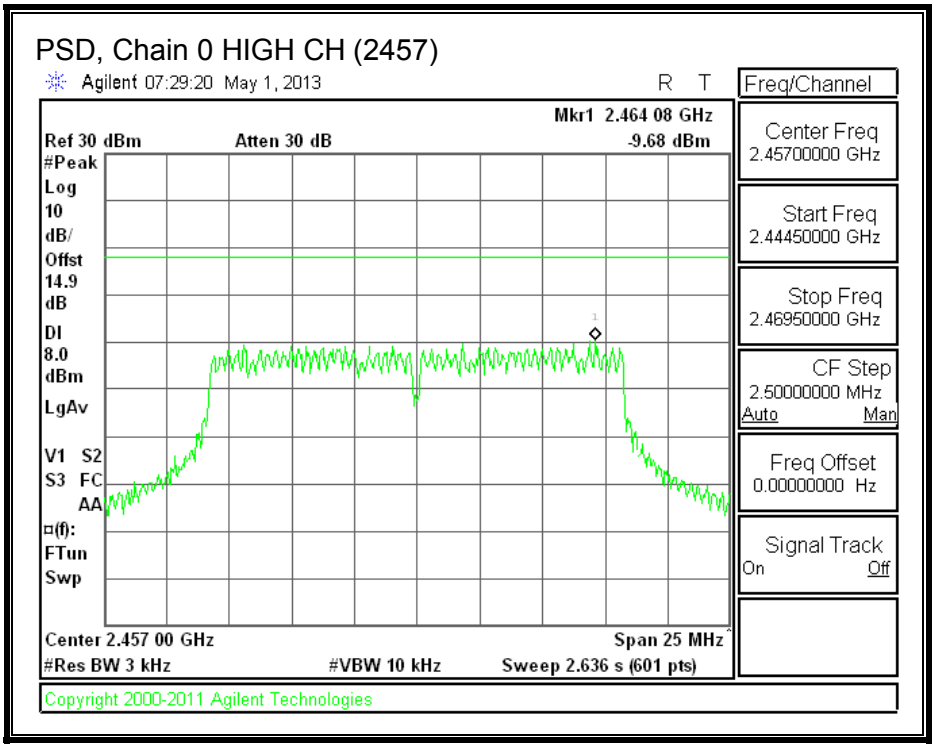
PSD, Chain 0 MID CH (2437)



PSD, Chain 0 HIGH CH (2457)



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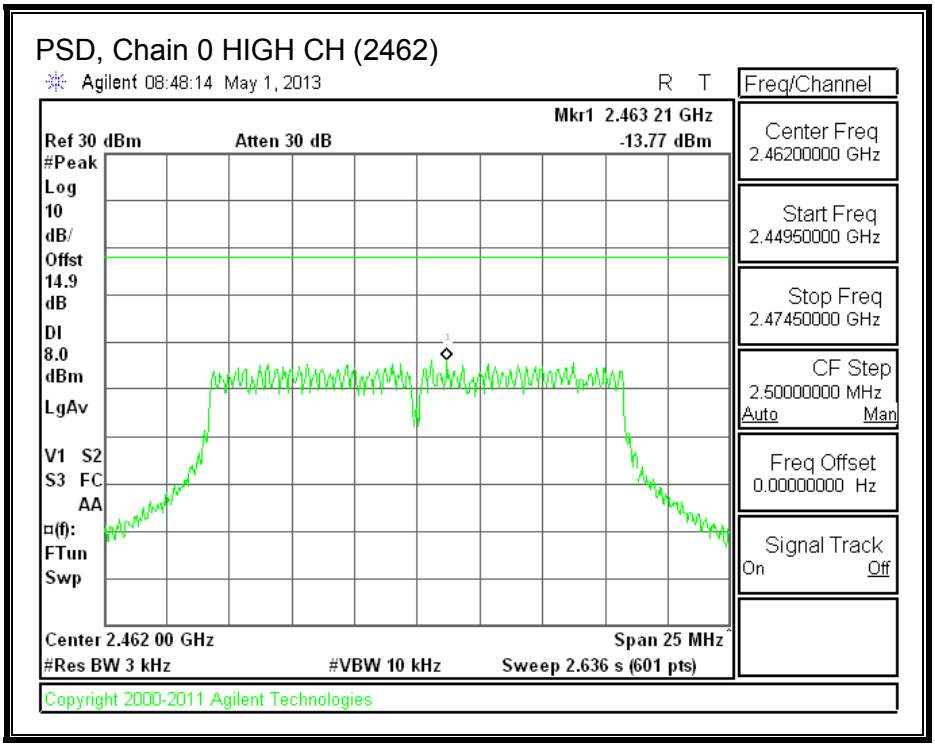
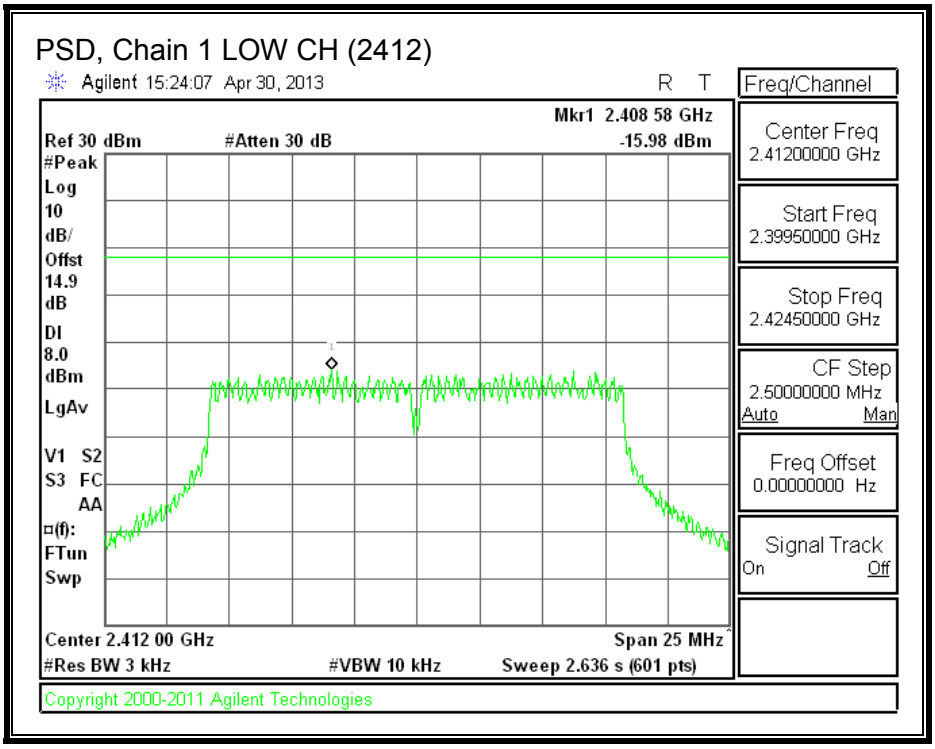


PSD, Chain 1



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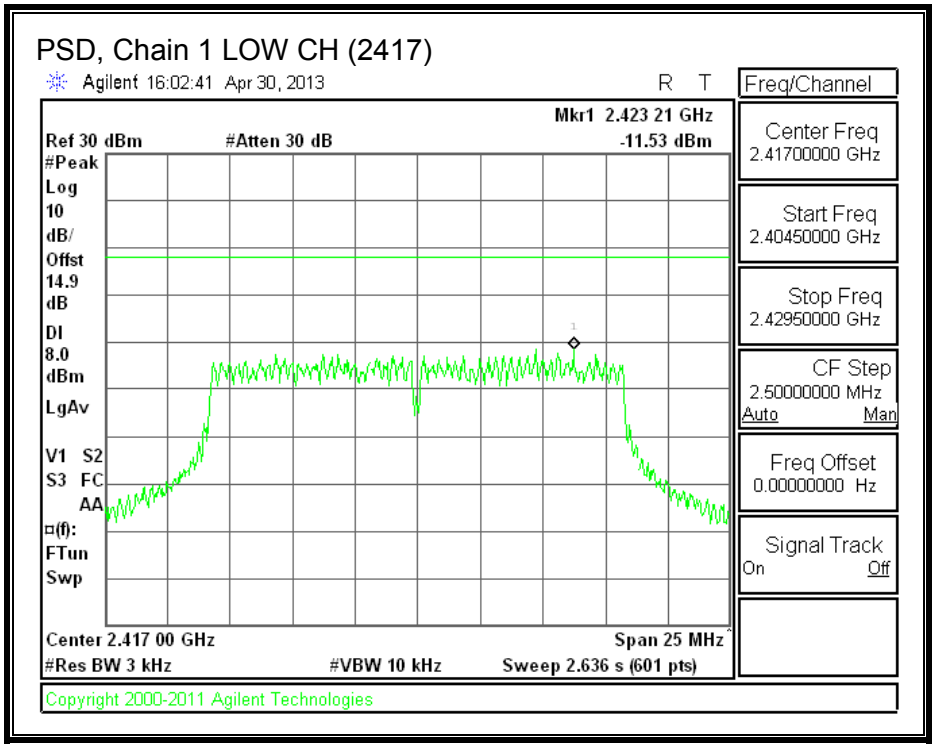
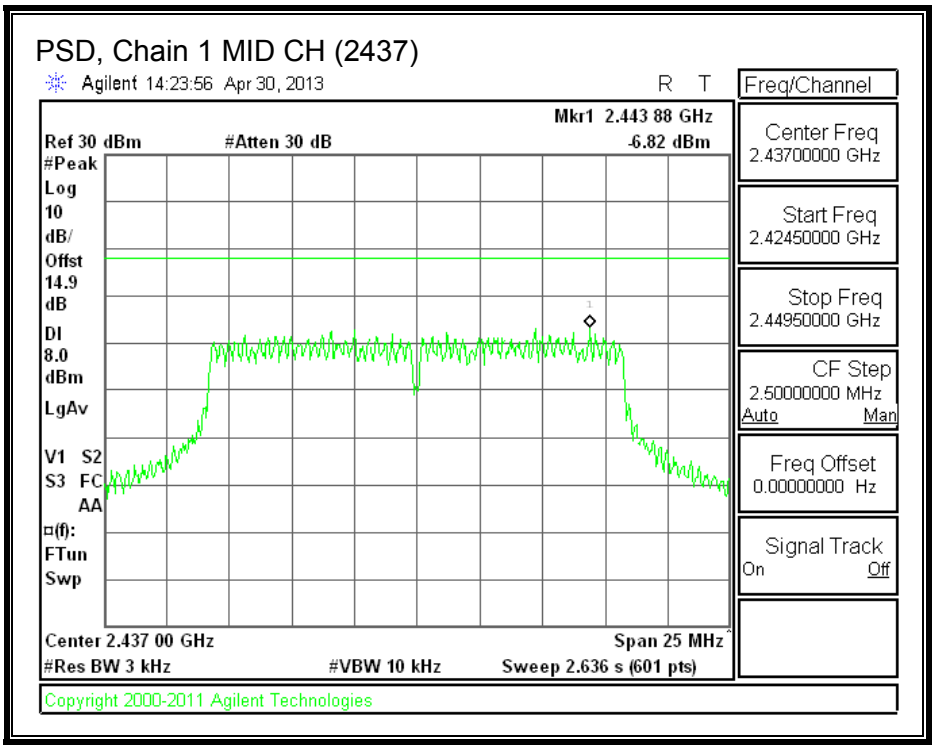
PSD, Chain 1 LOW CH (2417)



PSD, Chain 1 MID CH (2437)



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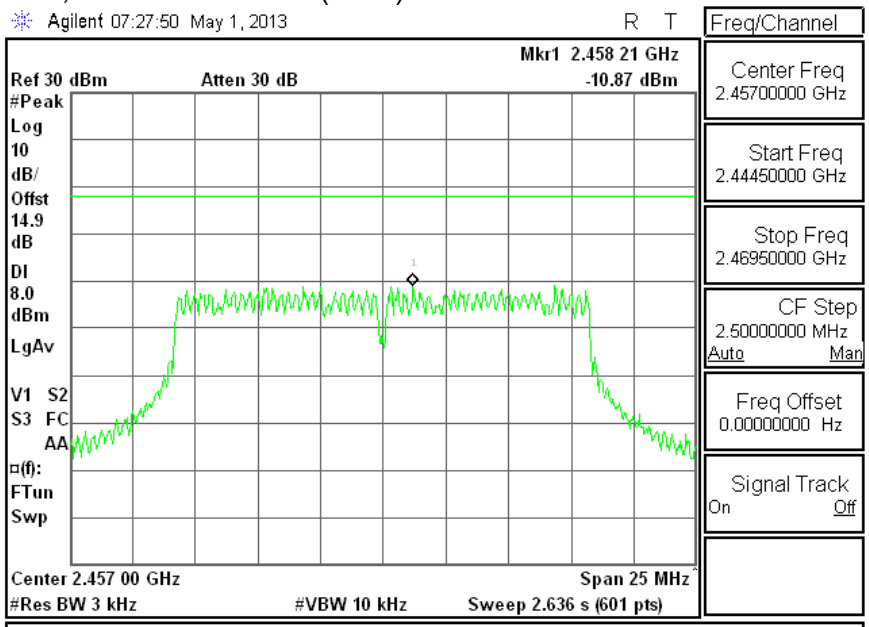
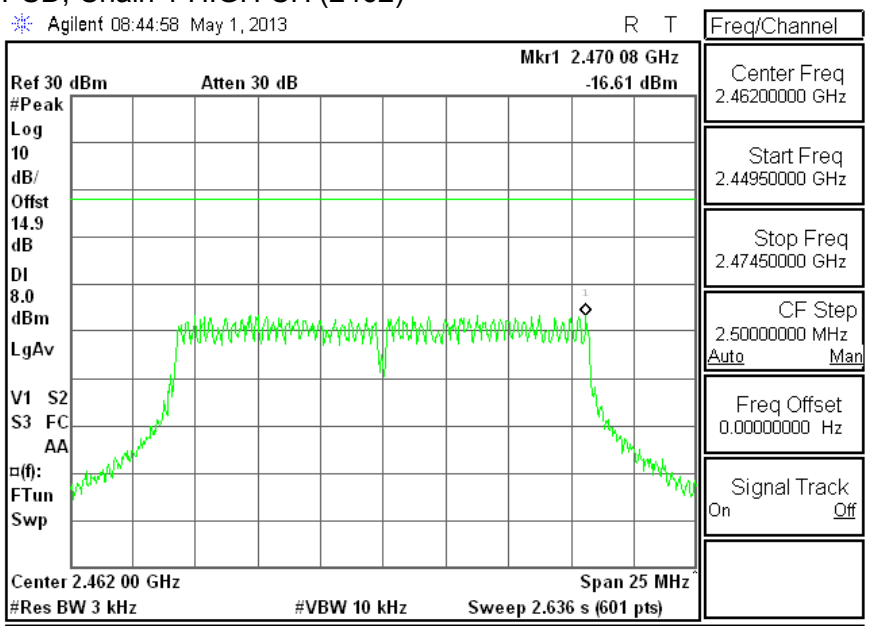
PSD, Chain 1 HIGH CH (2457)



PSD, Chain 1 HIGH CH (2462)



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8.2.6. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

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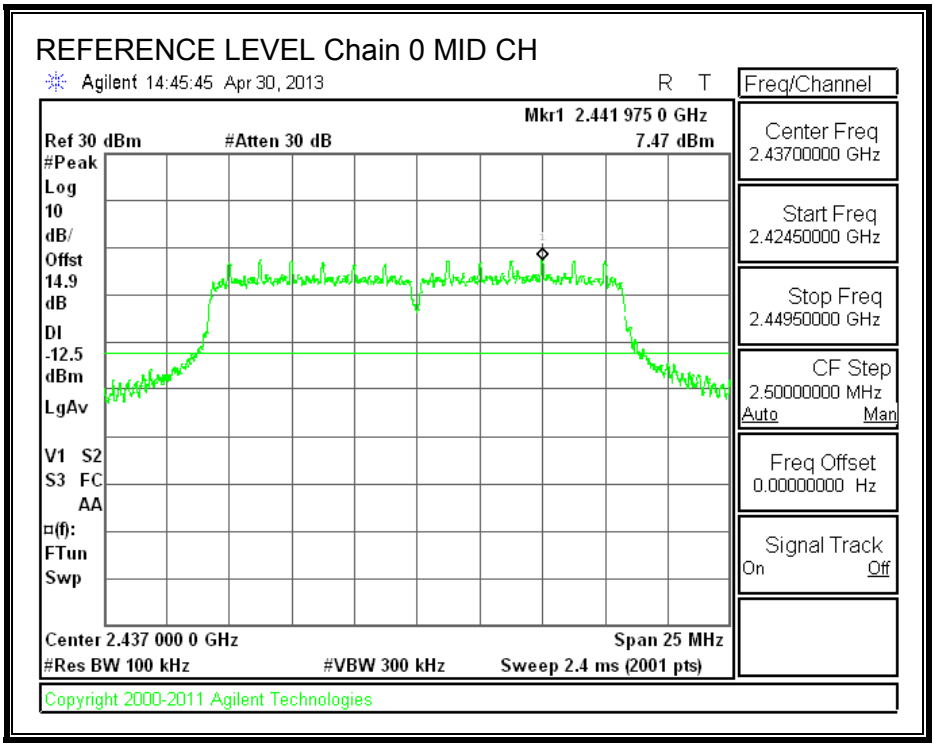
RESULTS

IN-BAND REFERENCE LEVEL, Chain 0



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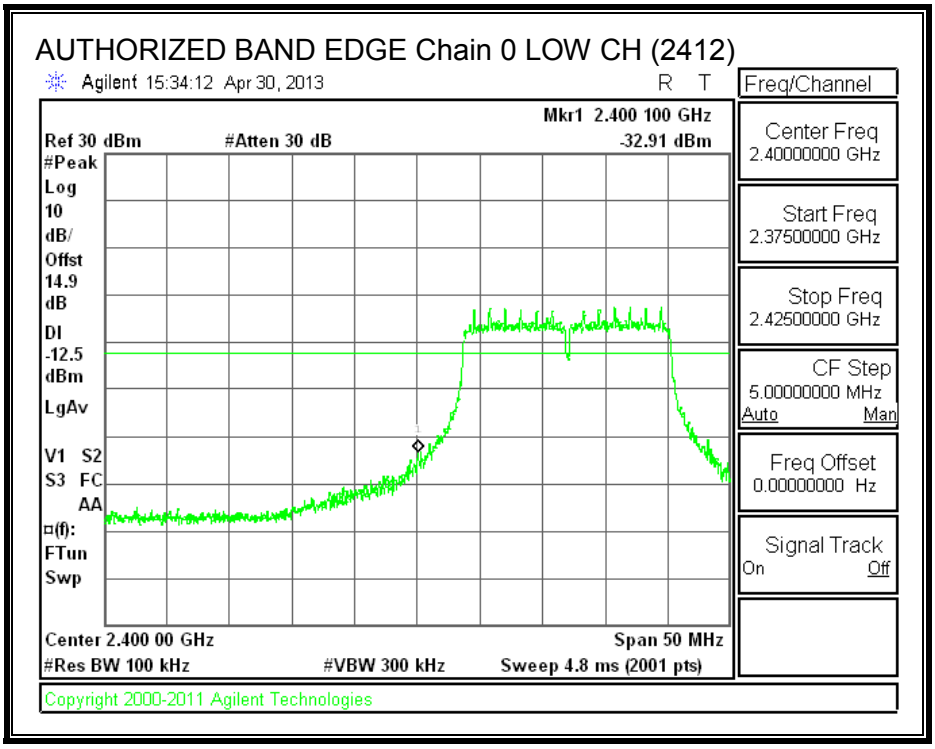
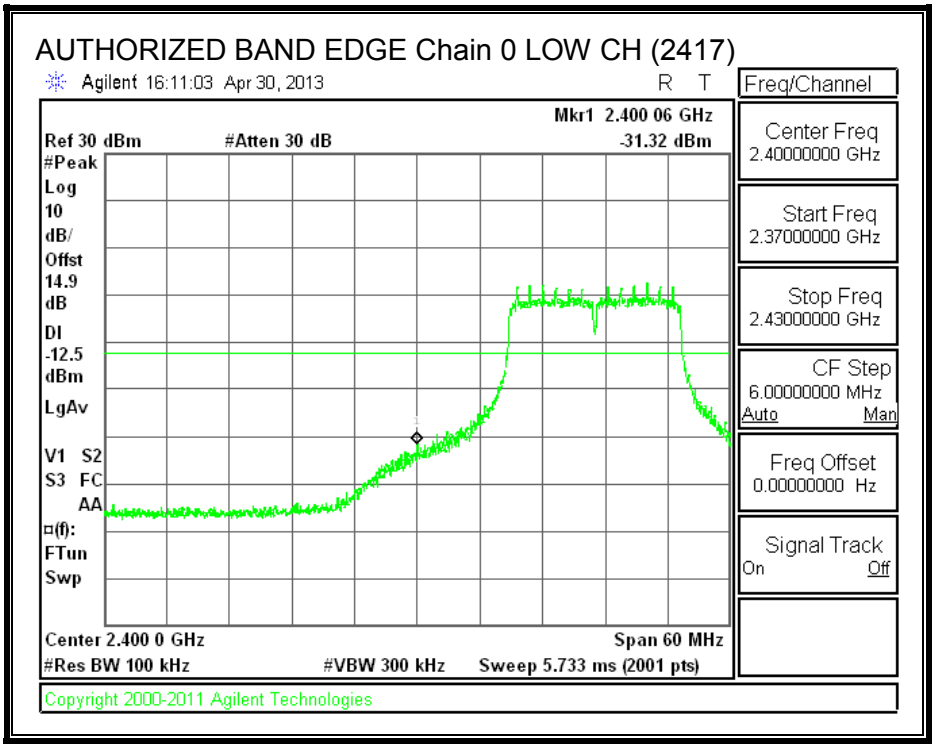
LOW CHANNEL BANDEDGE, Chain 0





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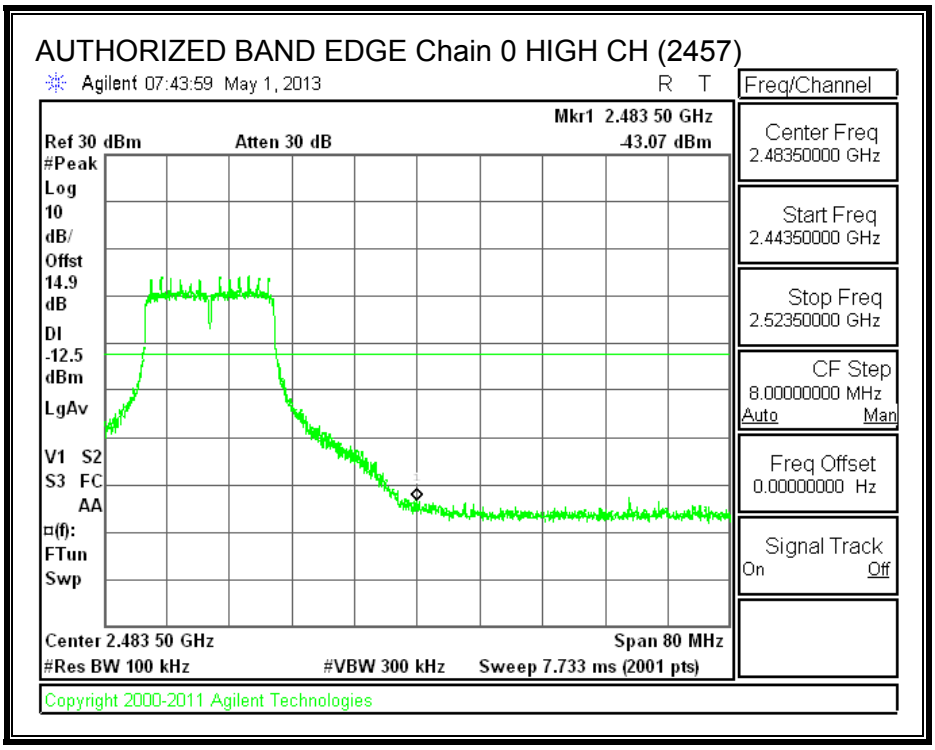
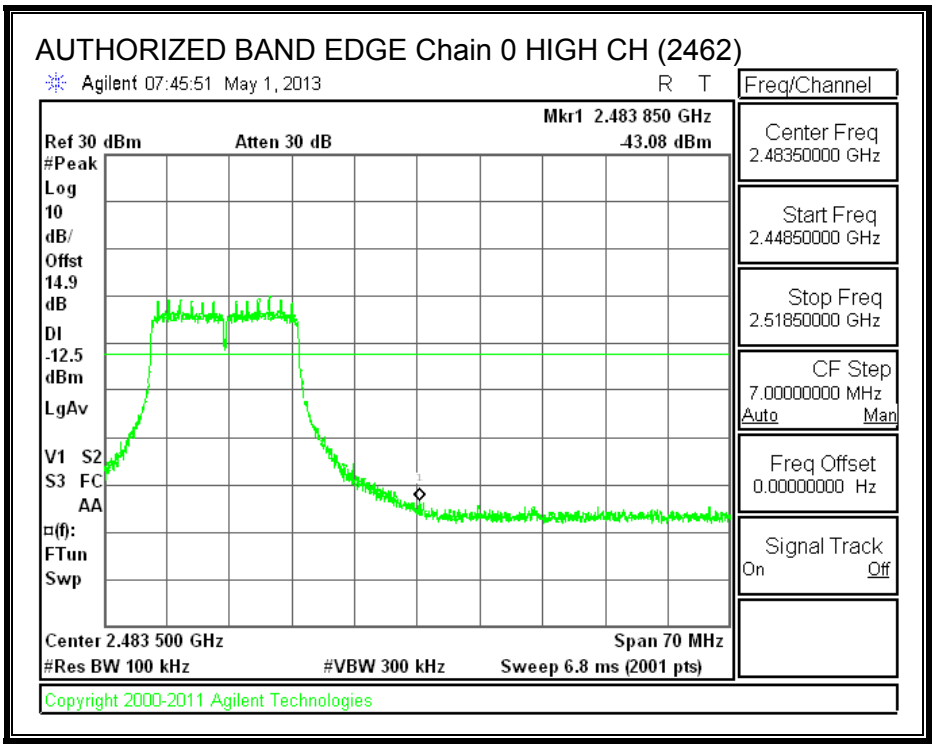
HIGH CHANNEL BANDEDGE, Chain 0





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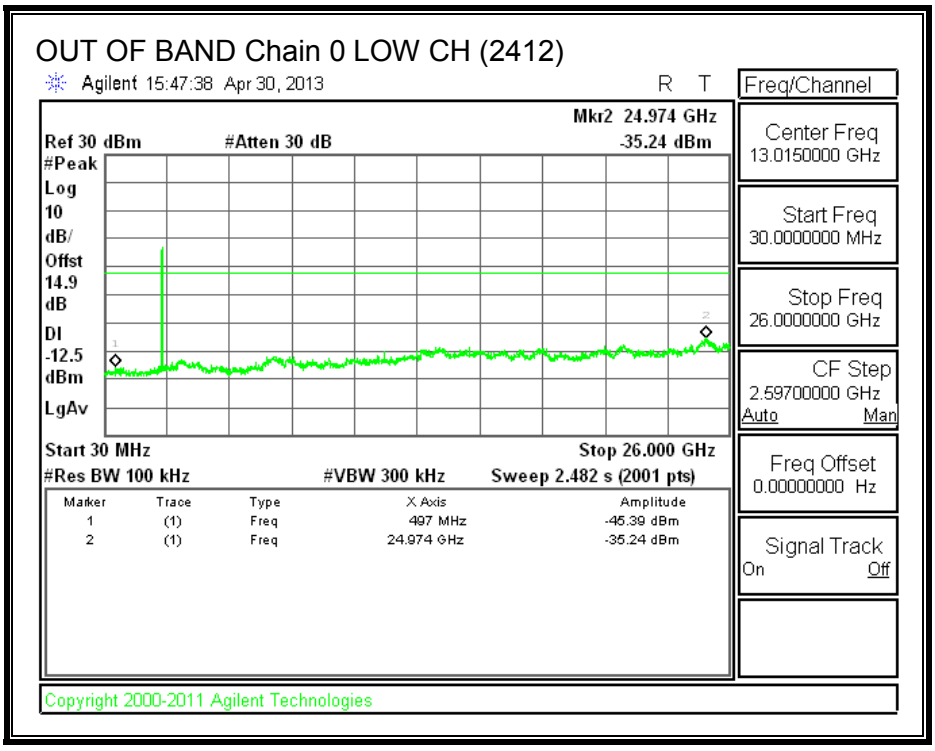
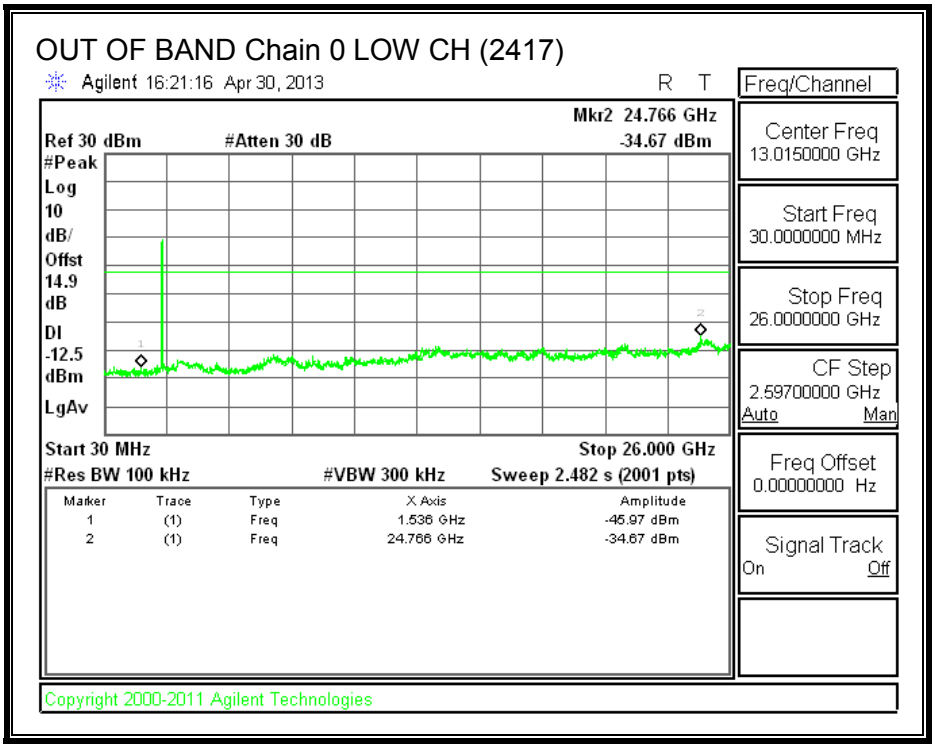
OUT-OF-BAND EMISSIONS, Chain 0





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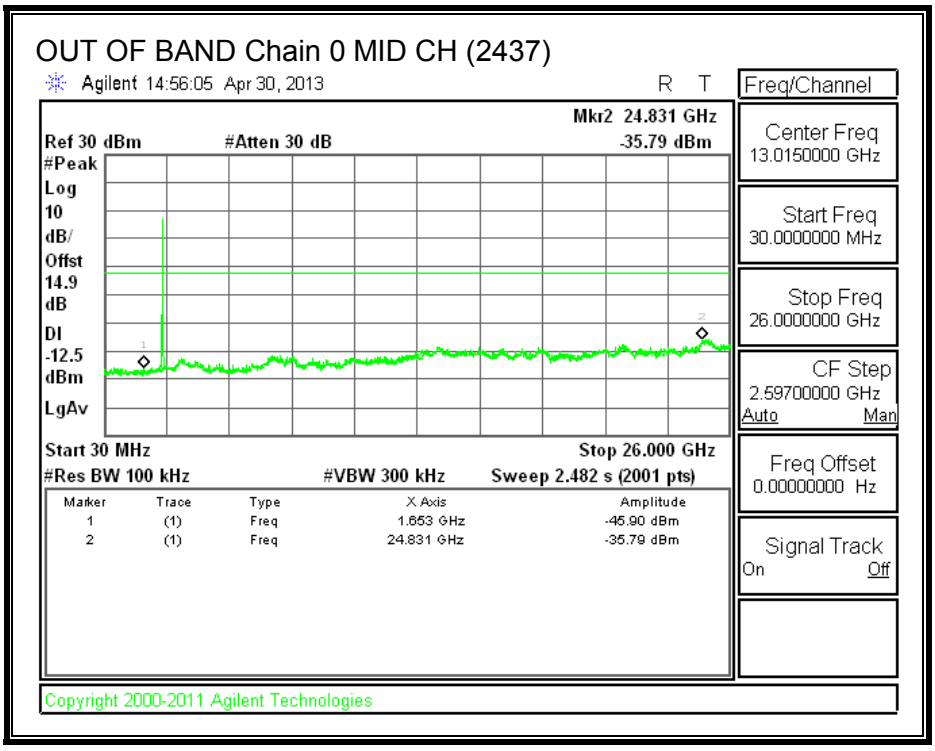

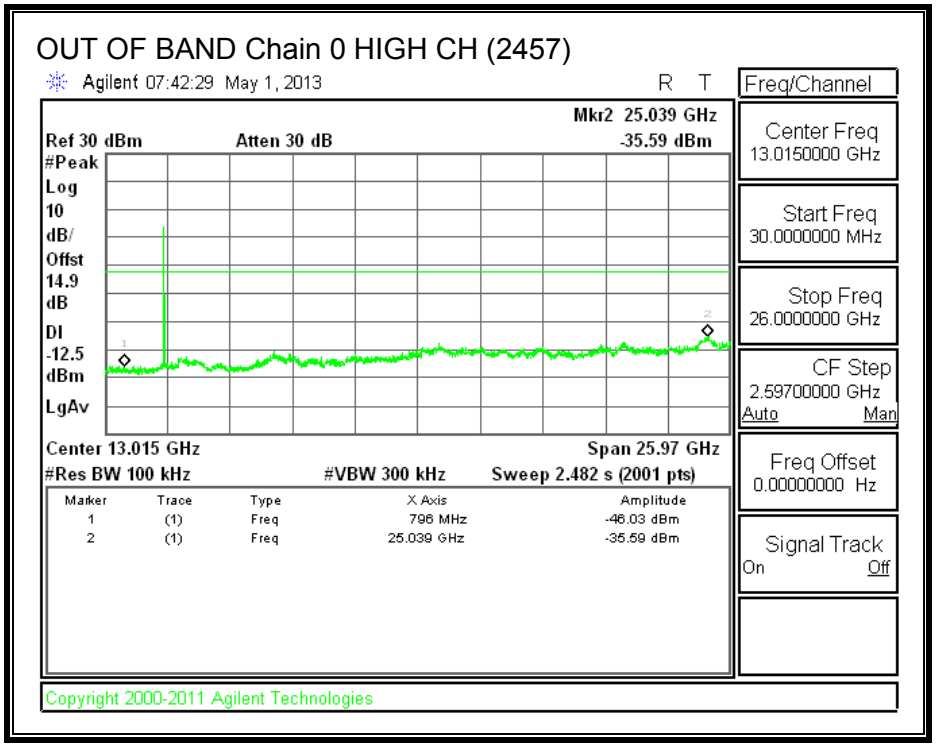

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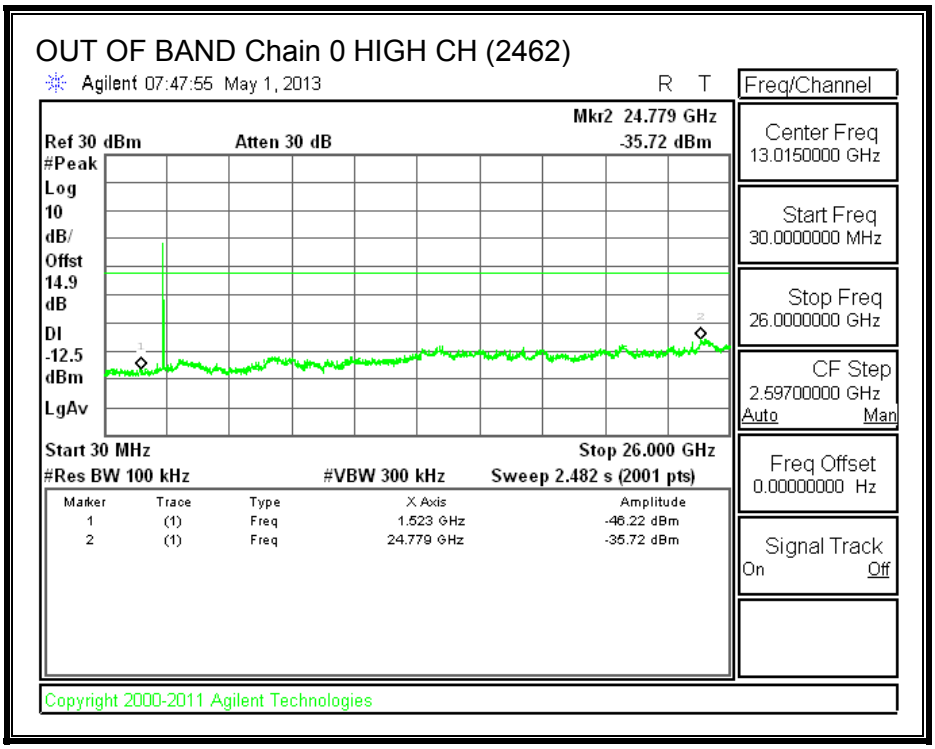

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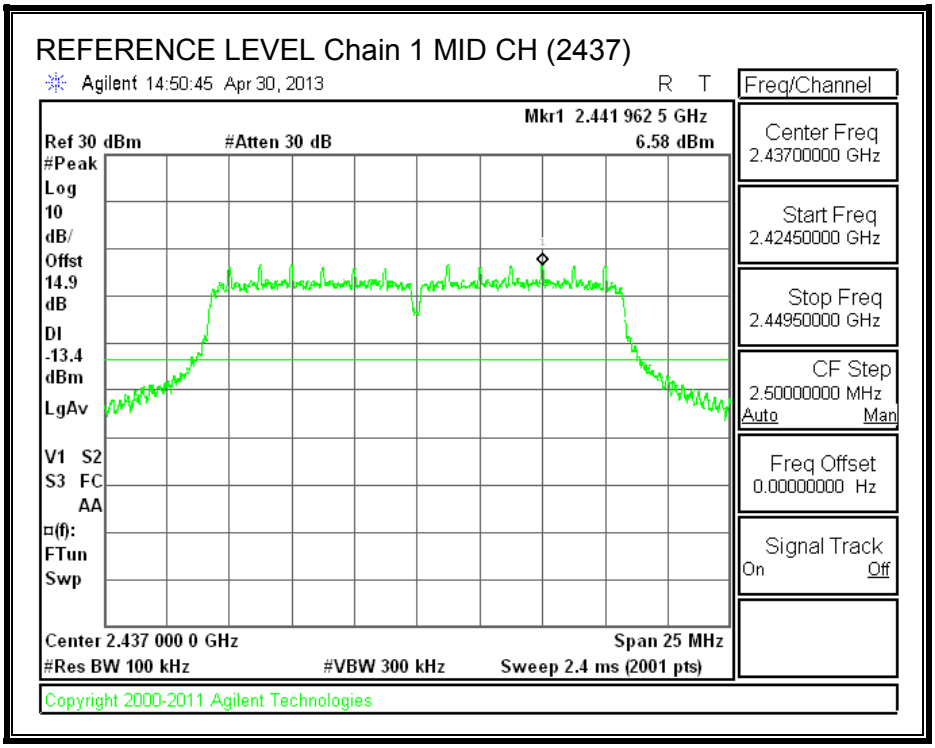
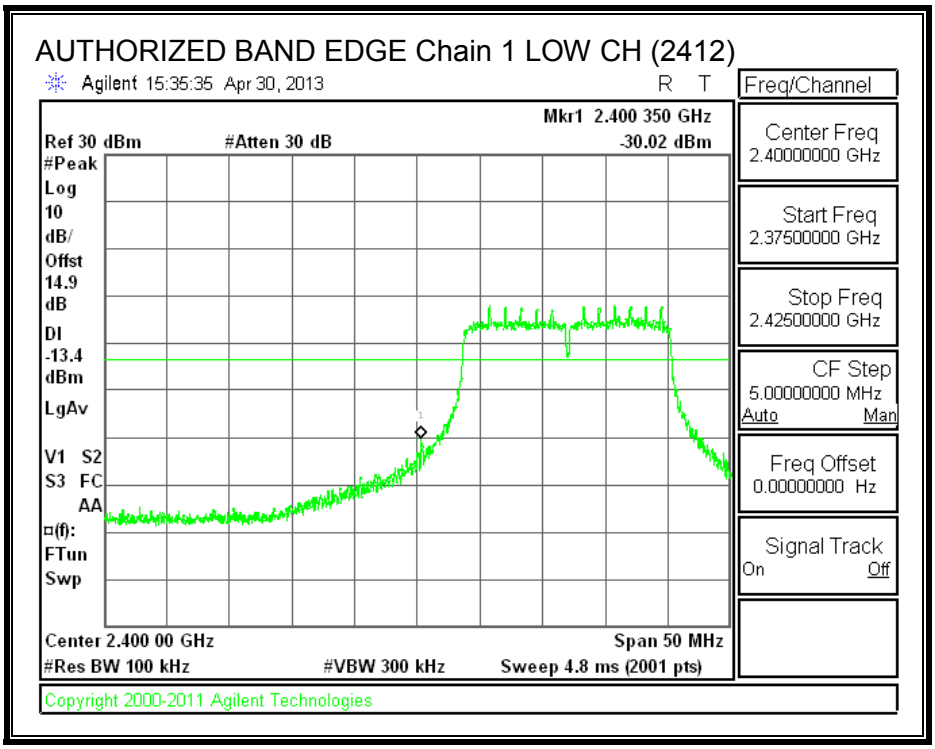
IN-BAND REFERENCE LEVEL, Chain 1



LOW CHANNEL BANDEDGE, Chain 1



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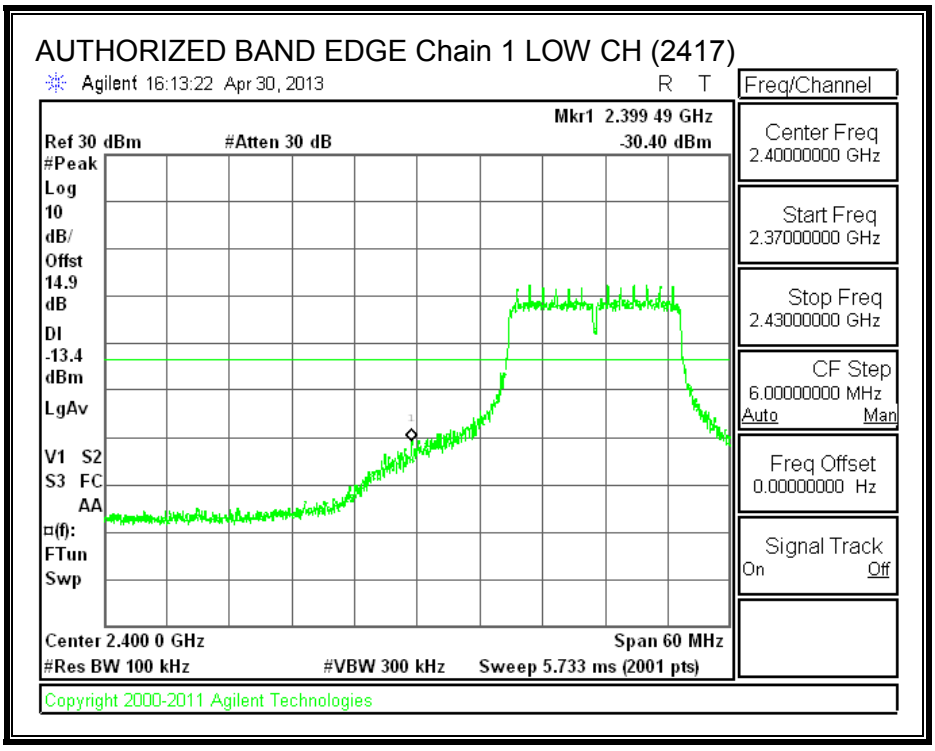
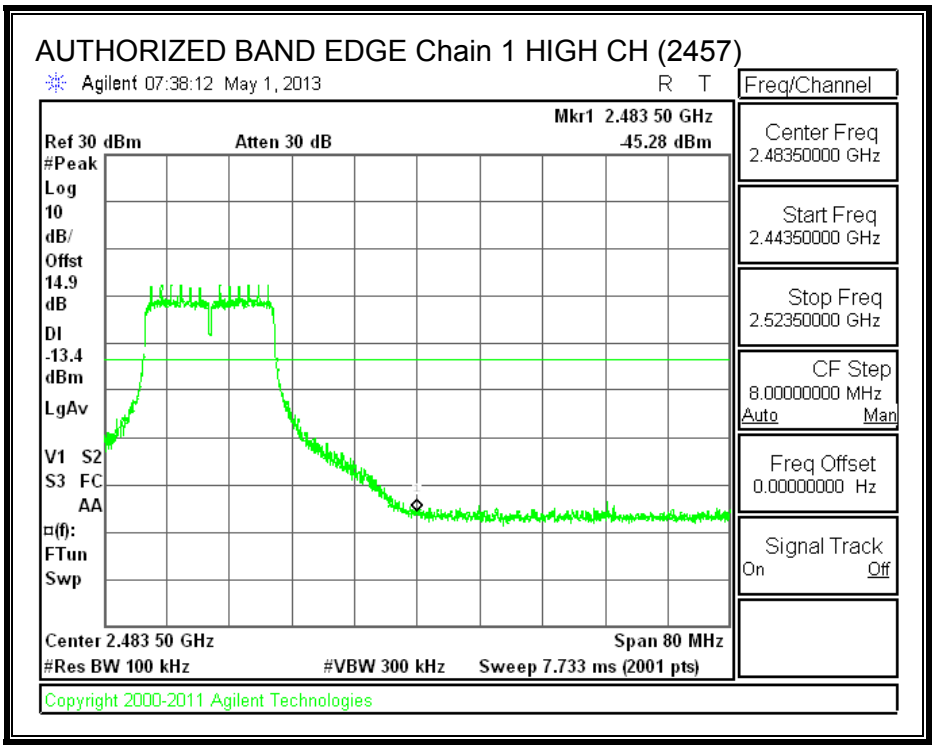


HIGH CHANNEL BANDEDGE, Chain 1



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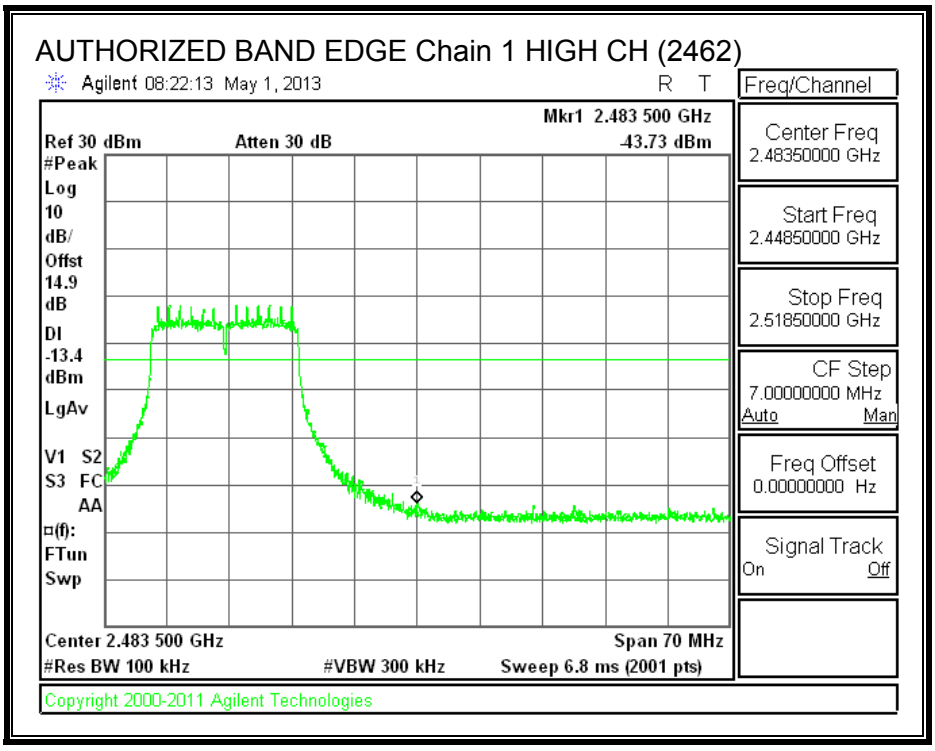
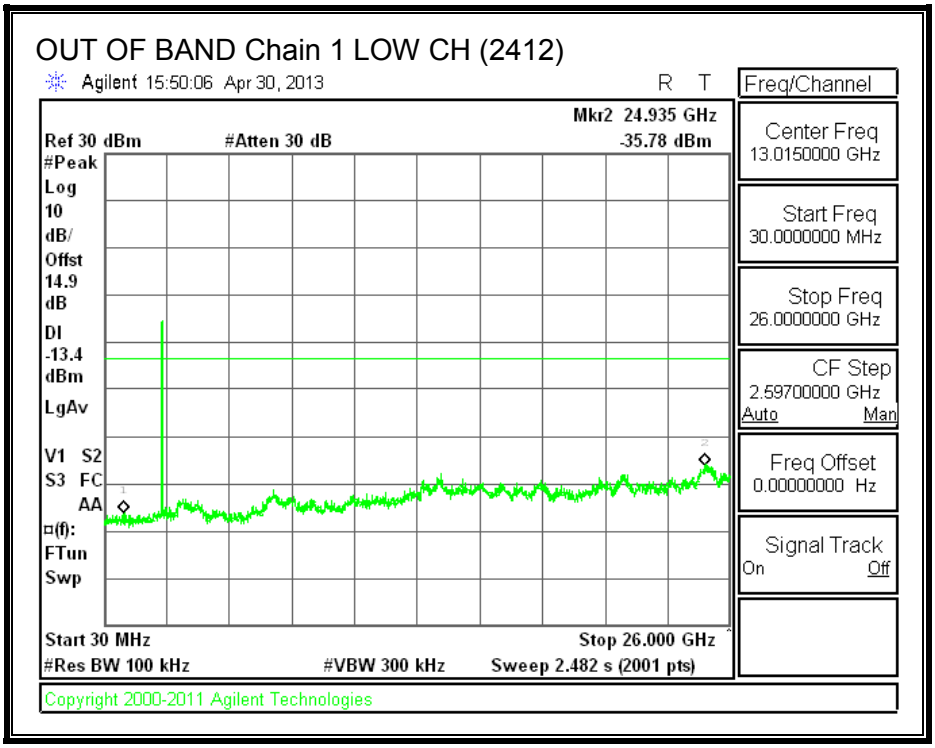


OUT-OF-BAND EMISSIONS, Chain 1



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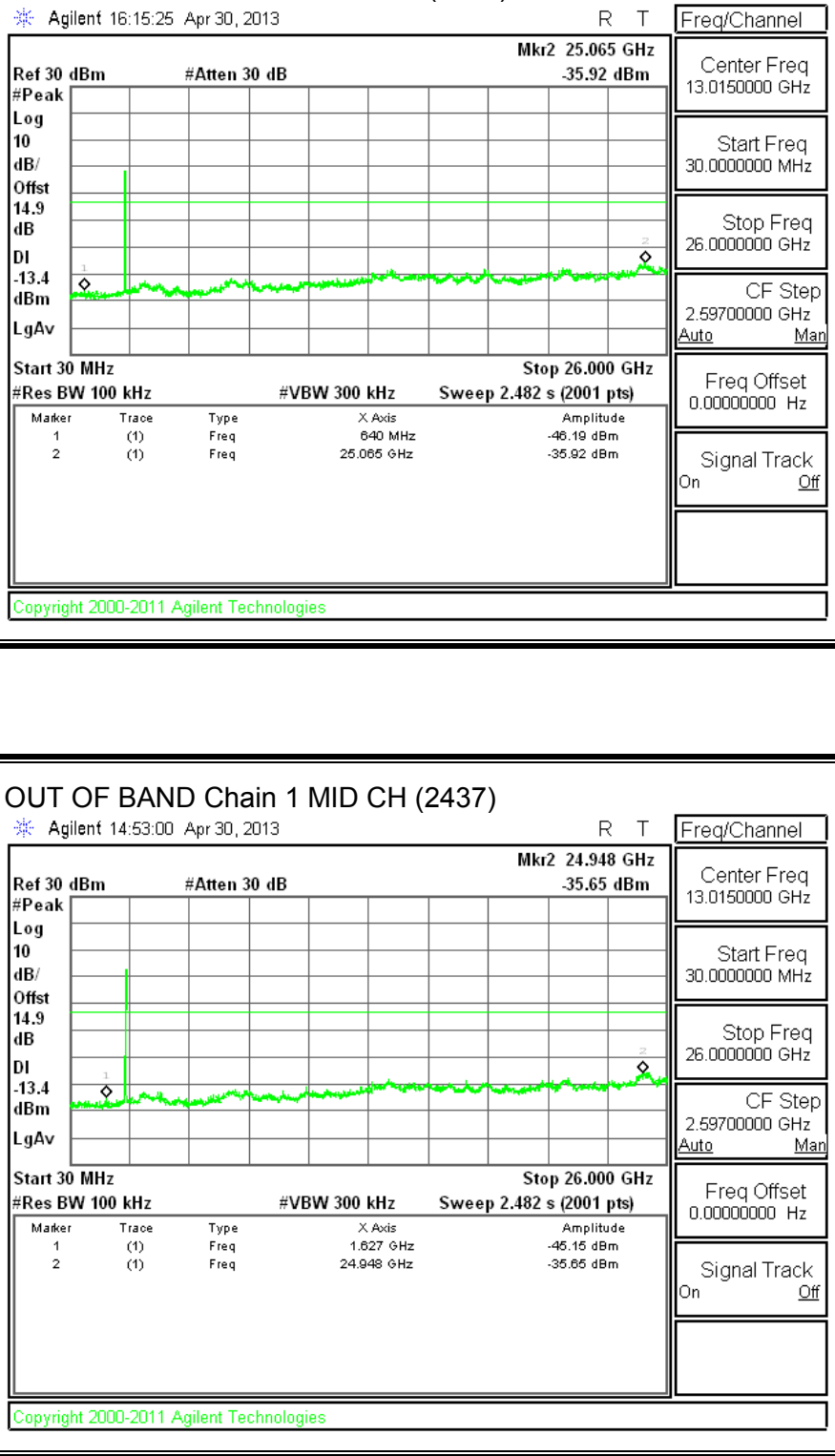
OUT OF BAND Chain 1 LOW CH (2417)



OUT OF BAND Chain 1 MID CH (2437)

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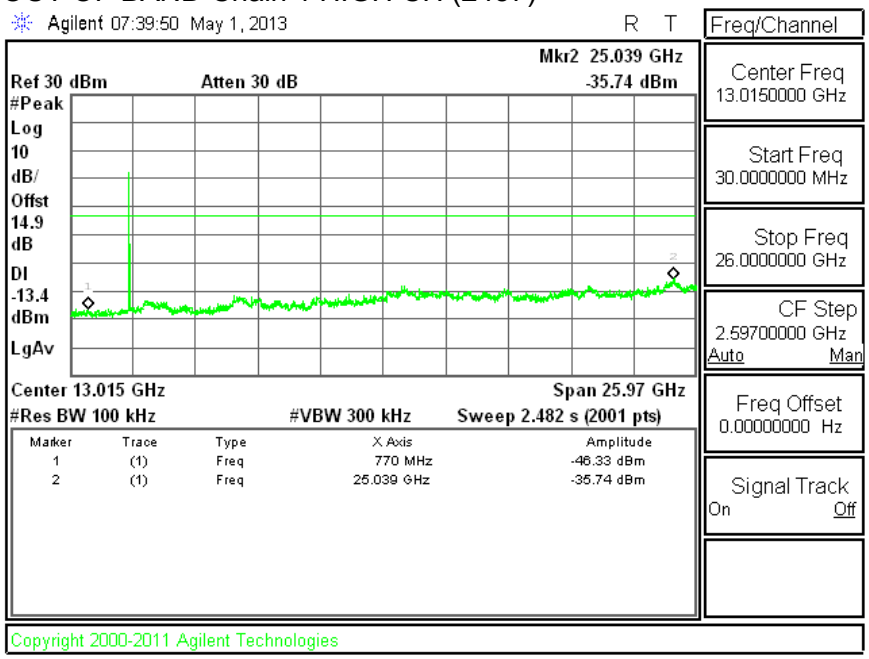
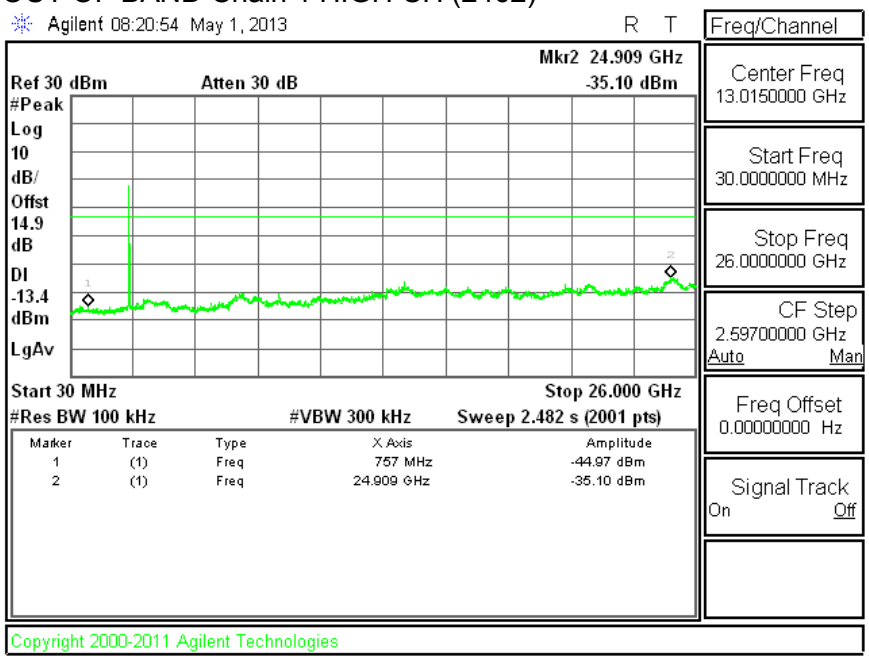
OUT OF BAND Chain 1 HIGH CH (2457)



OUT OF BAND Chain 1 HIGH CH (2462)



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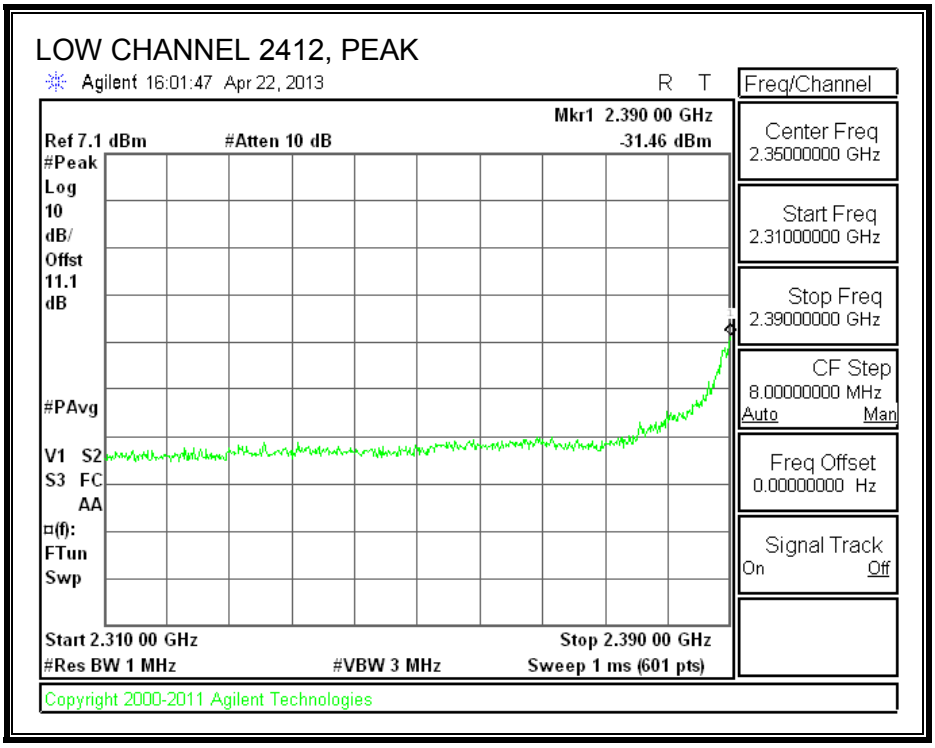
8.2.7. CONDUCTED BE AND SPURIOUS IN RESTRICTED BANDS (no filter unit)

RESTRICTED BANDEDGE

Chain 0



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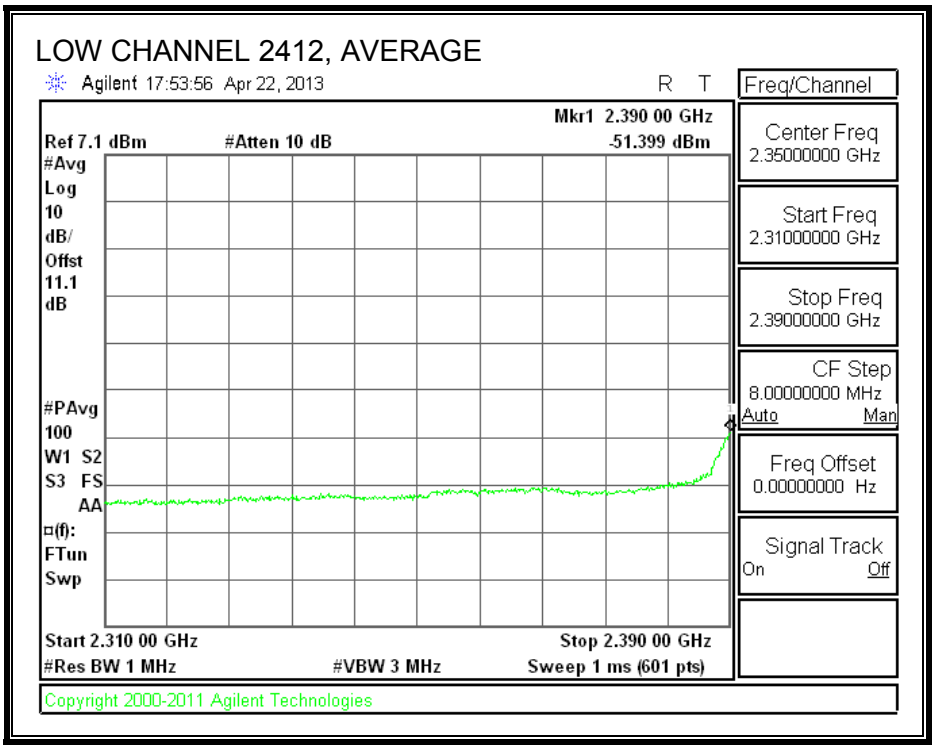
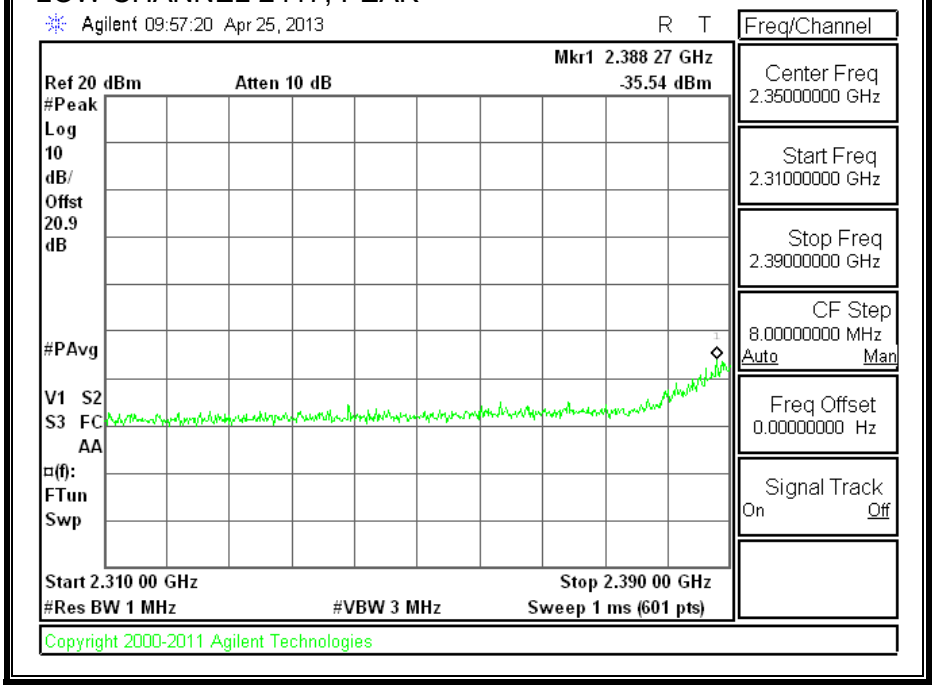
LOW CHANNEL 2412, AVERAGE



LOW CHANNEL 2417, PEAK



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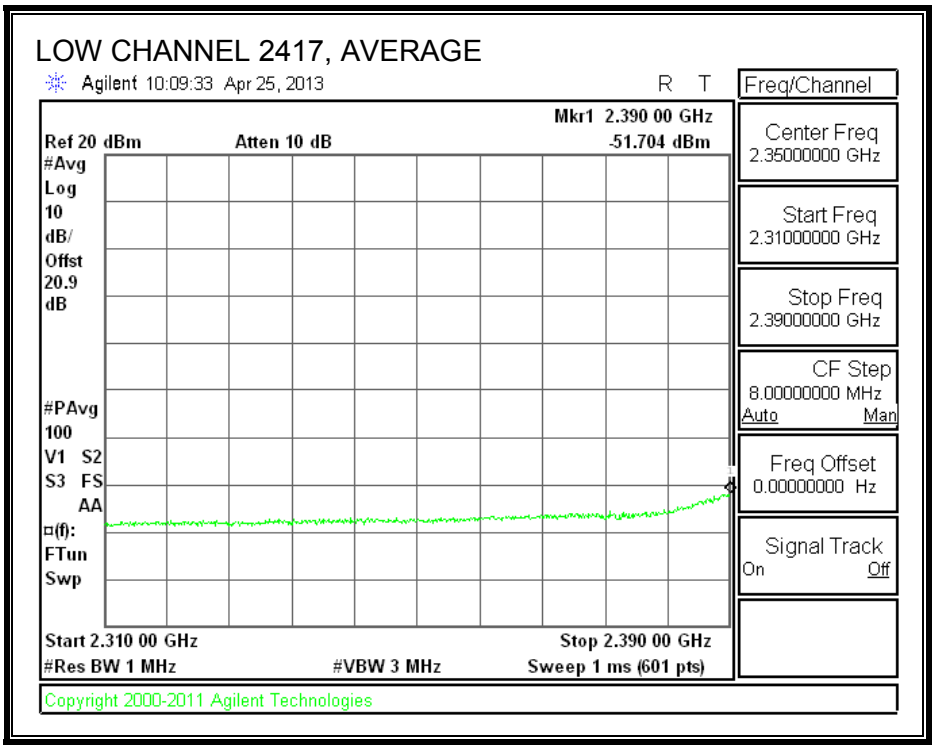

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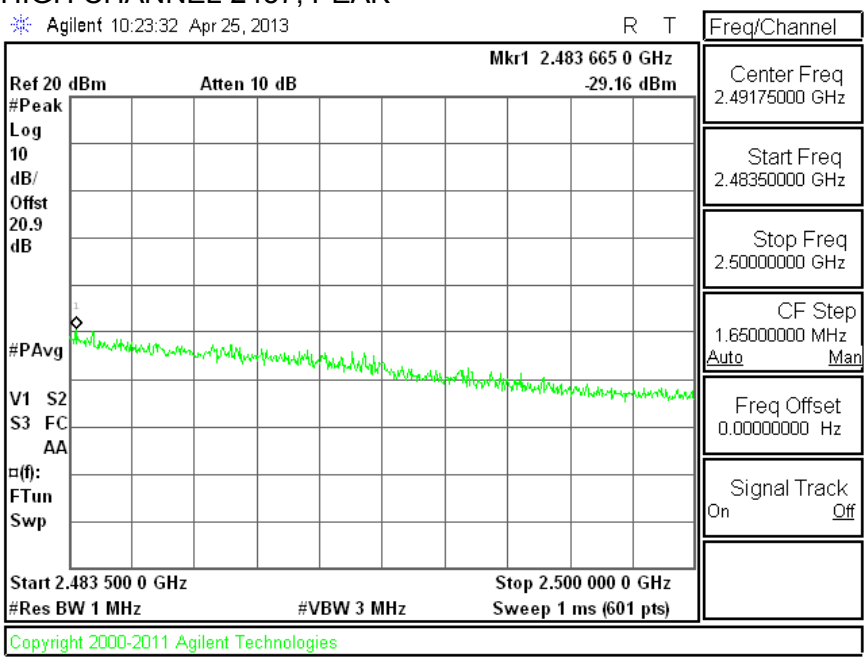
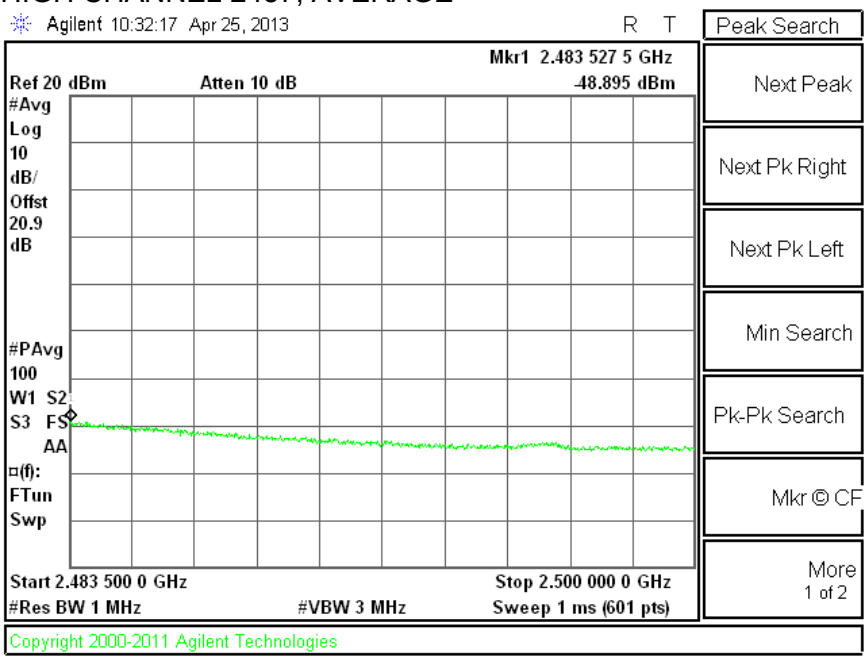
HIGH CHANNEL 2457, PEAK



HIGH CHANNEL 2457, AVERAGE



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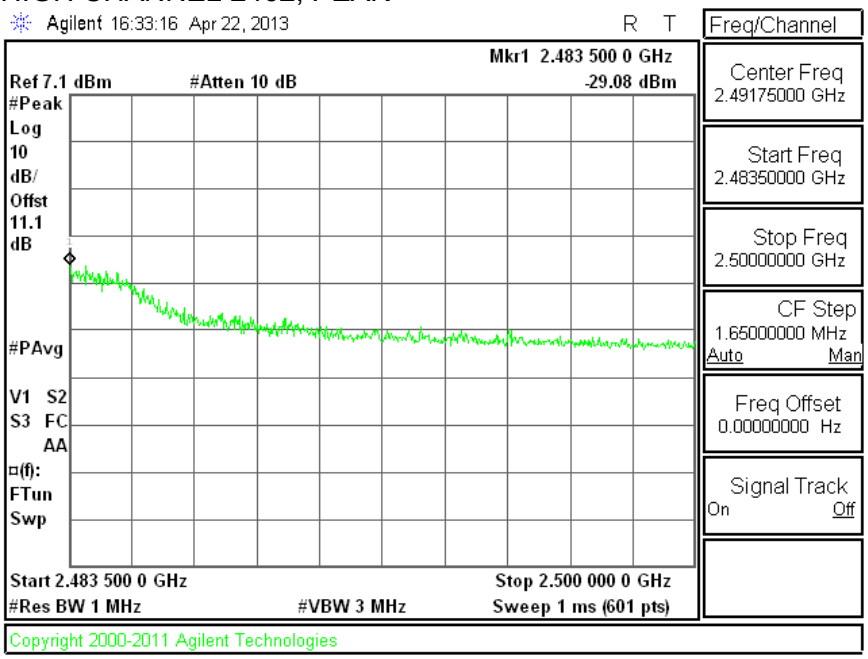
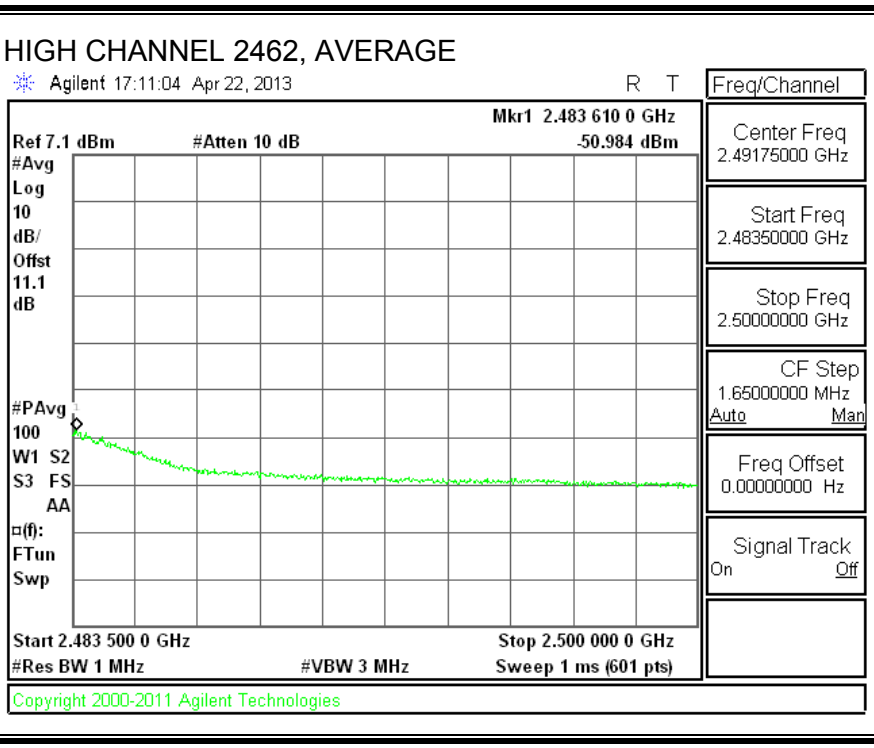
HIGH CHANNEL 2462, PEAK



HIGH CHANNEL 2462, AVERAGE



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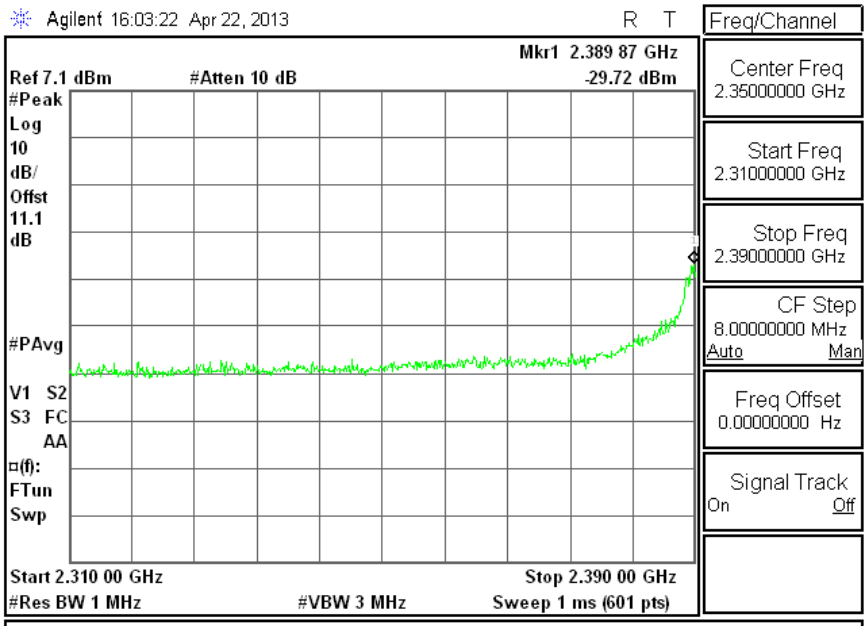
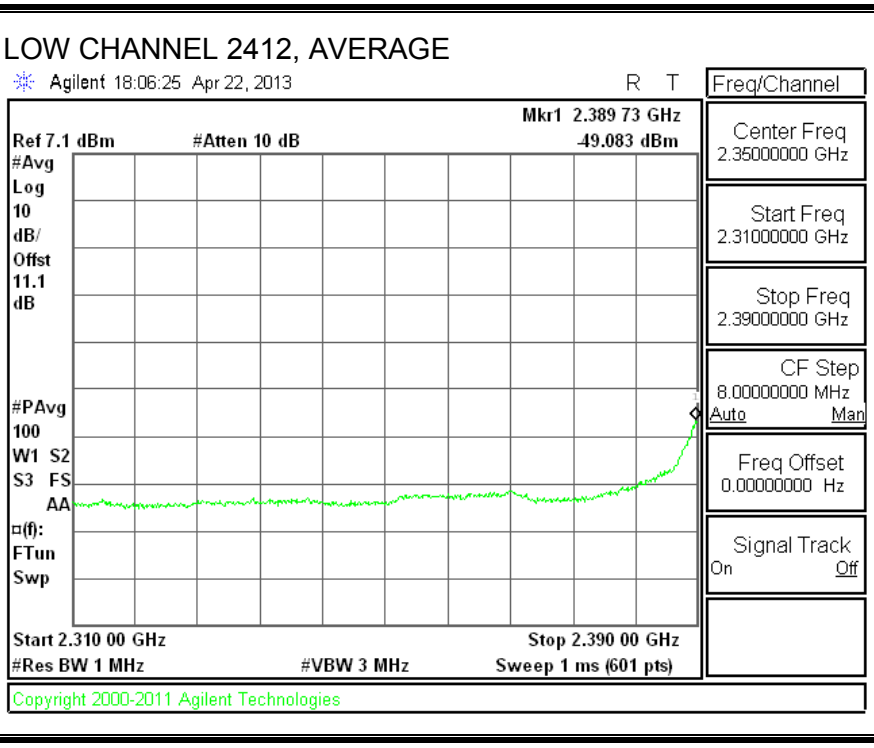
Chain 1

LOW CHANNEL 2412, PEAK



LOW CHANNEL 2412, AVERAGE



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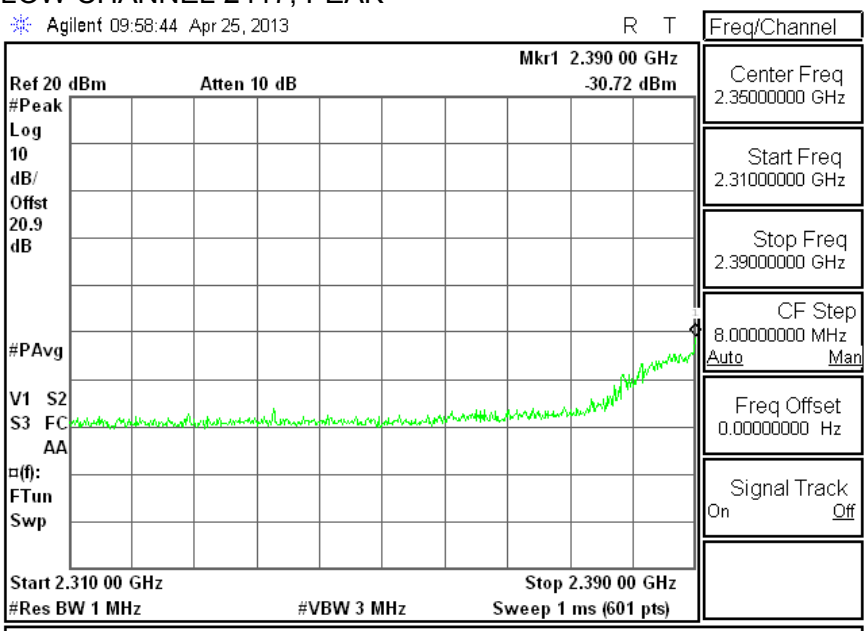
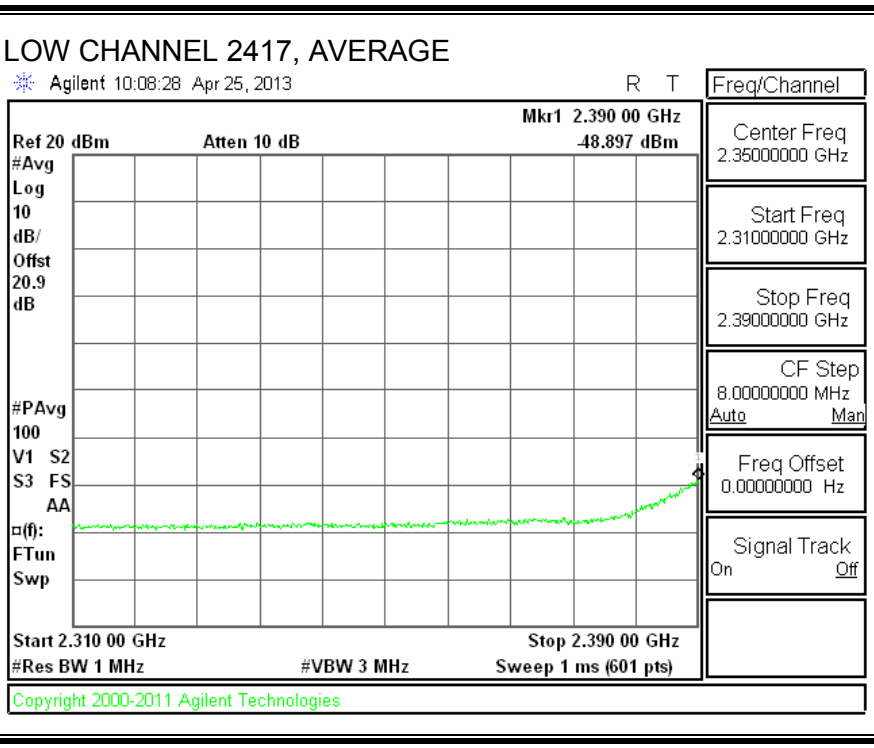
LOW CHANNEL 2417, PEAK



LOW CHANNEL 2417, AVERAGE



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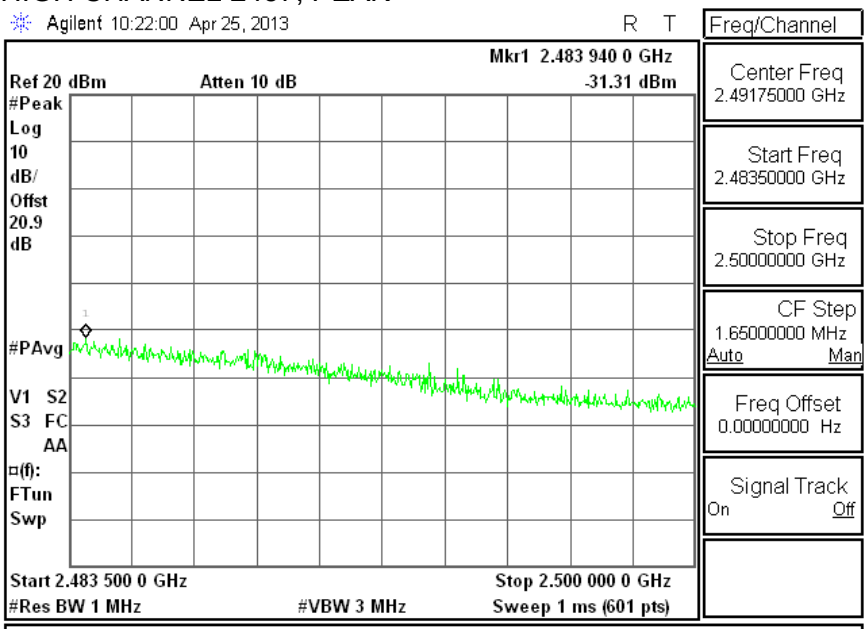
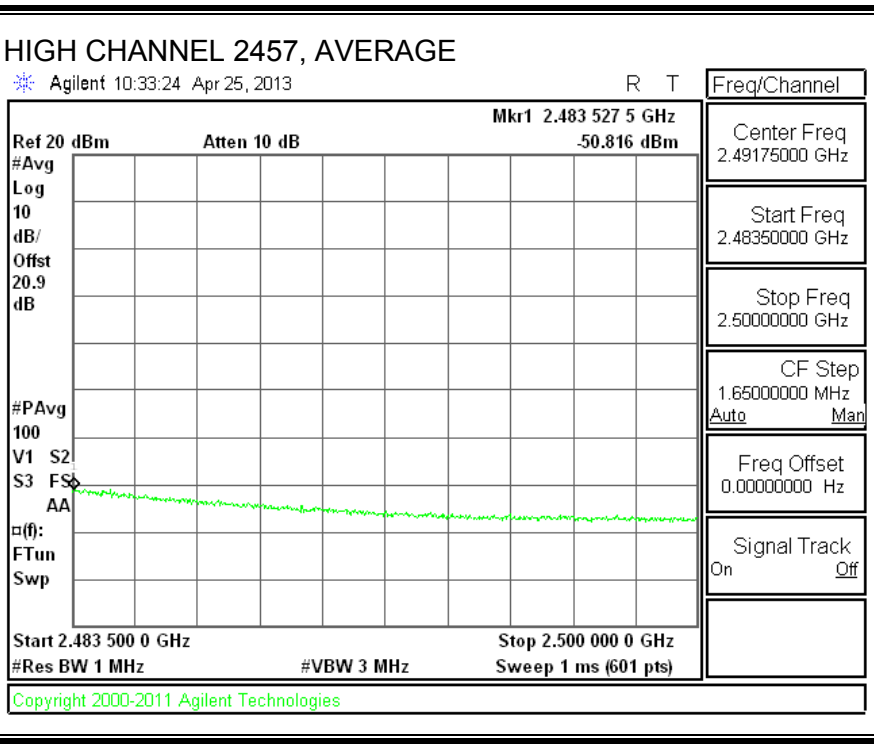
HIGH CHANNEL 2457, PEAK



HIGH CHANNEL 2457, AVERAGE



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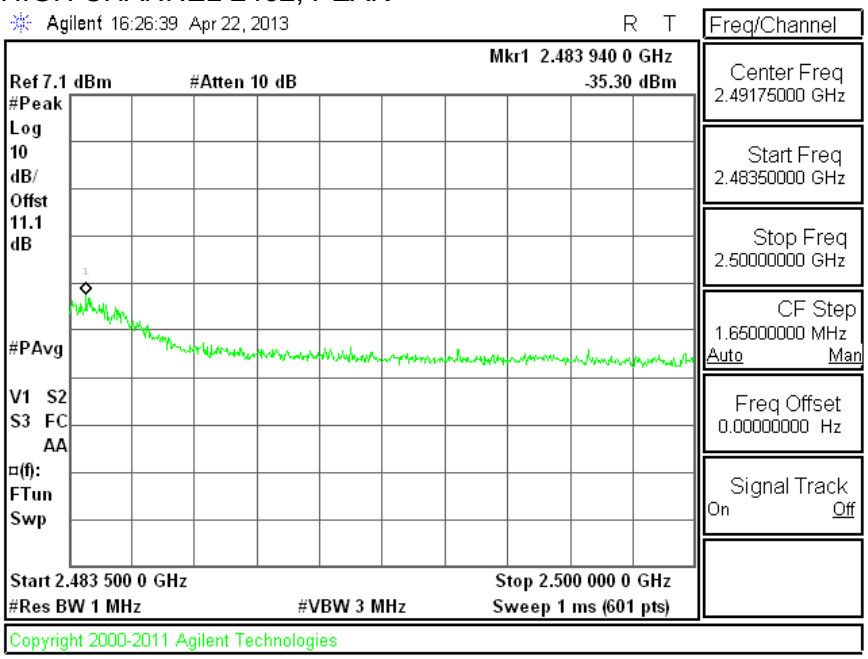
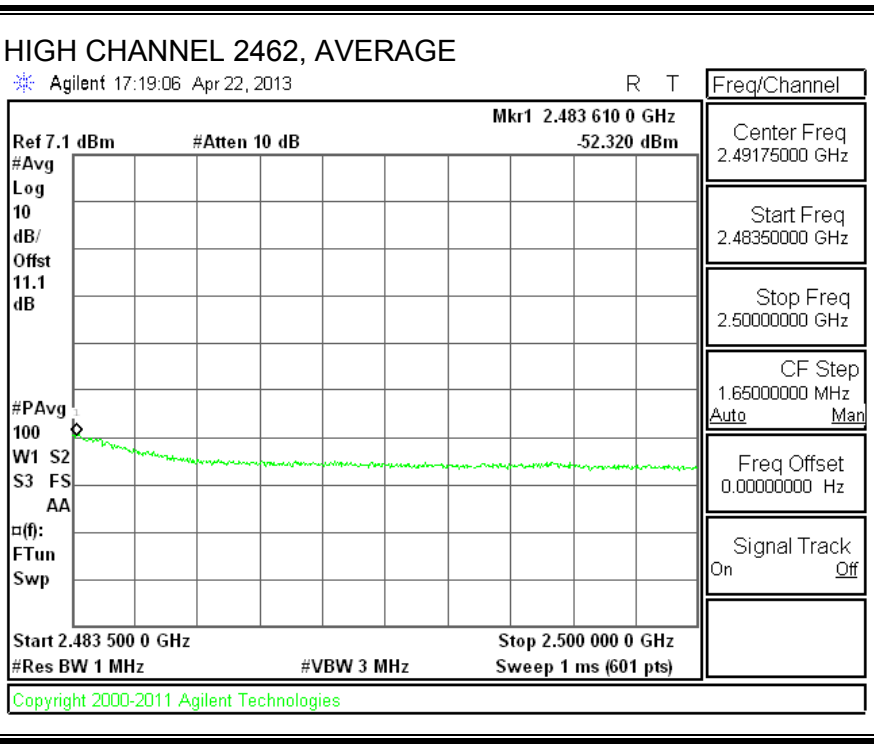
HIGH CHANNEL 2462, PEAK



HIGH CHANNEL 2462, AVERAGE



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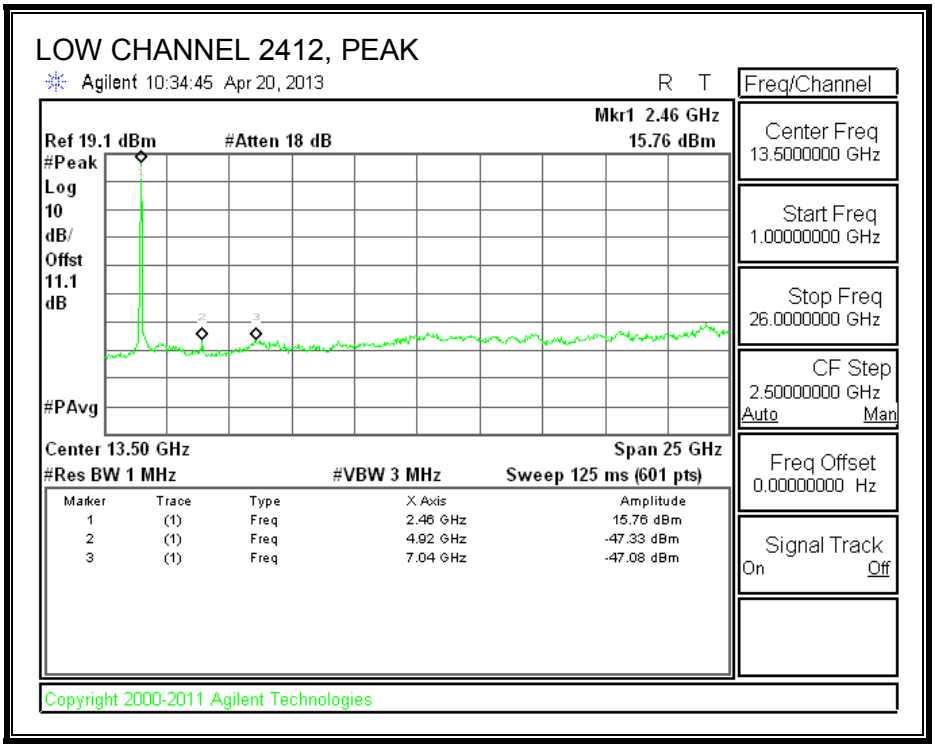
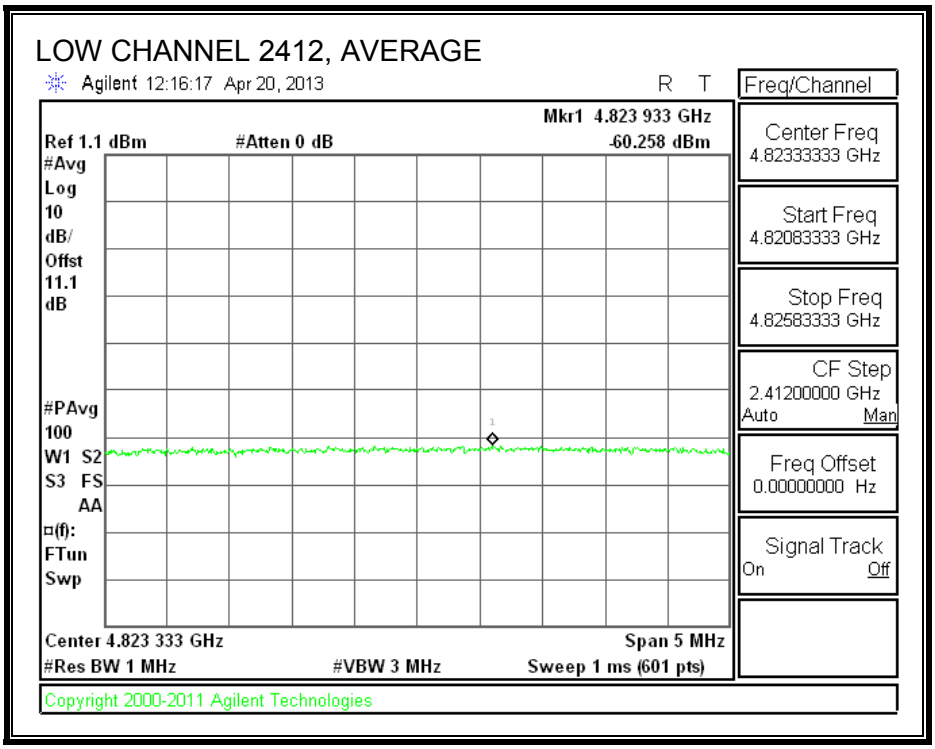
HARMONICS AND SPURIOUS

Chain 0





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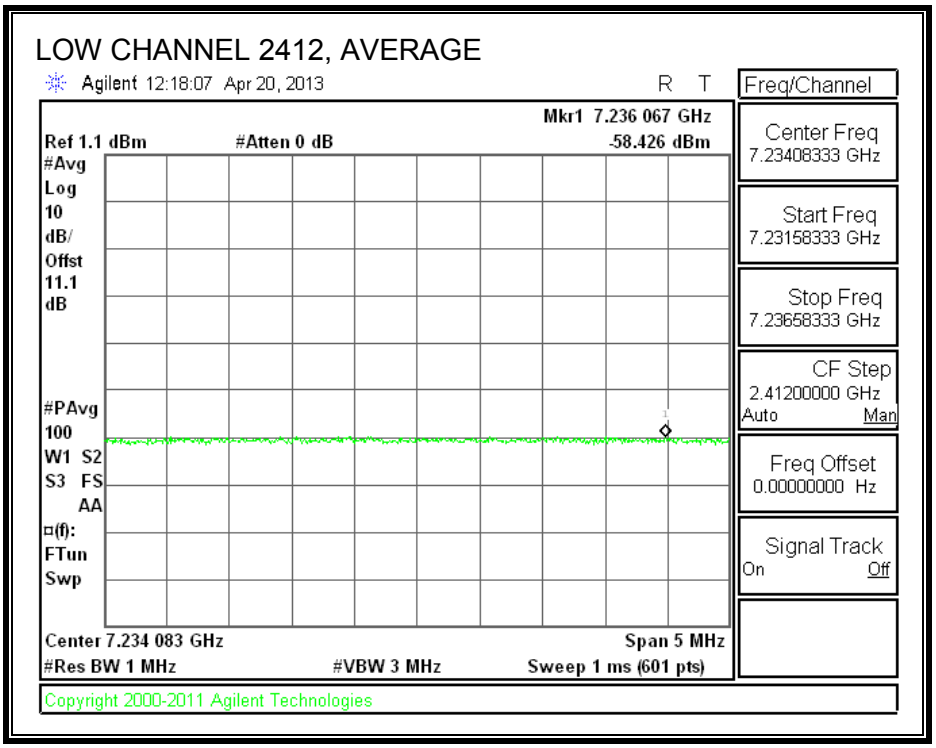

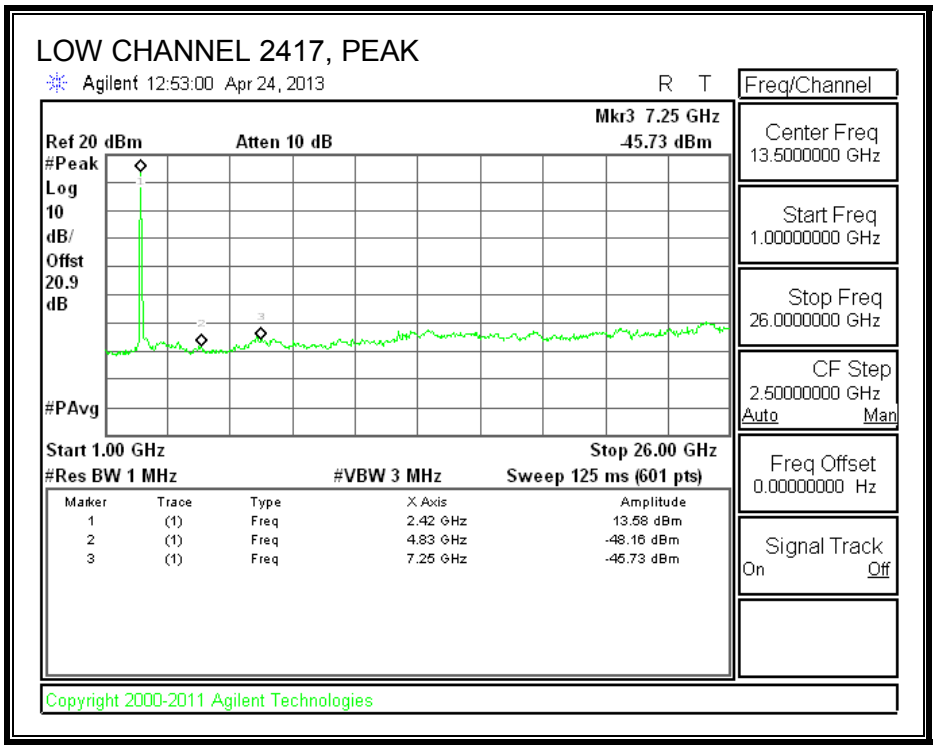

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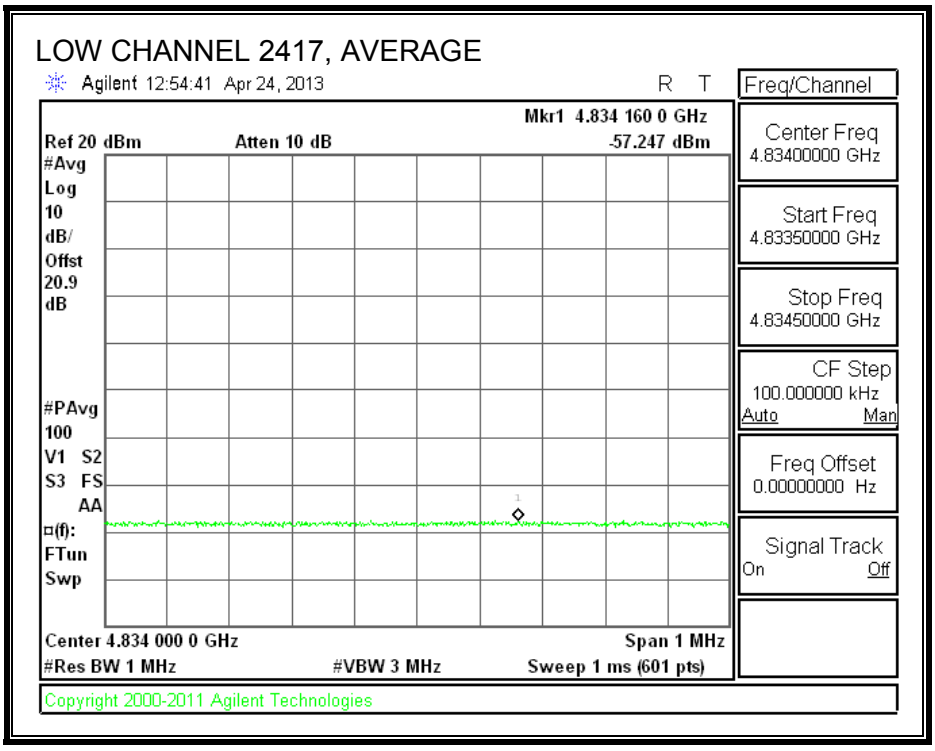

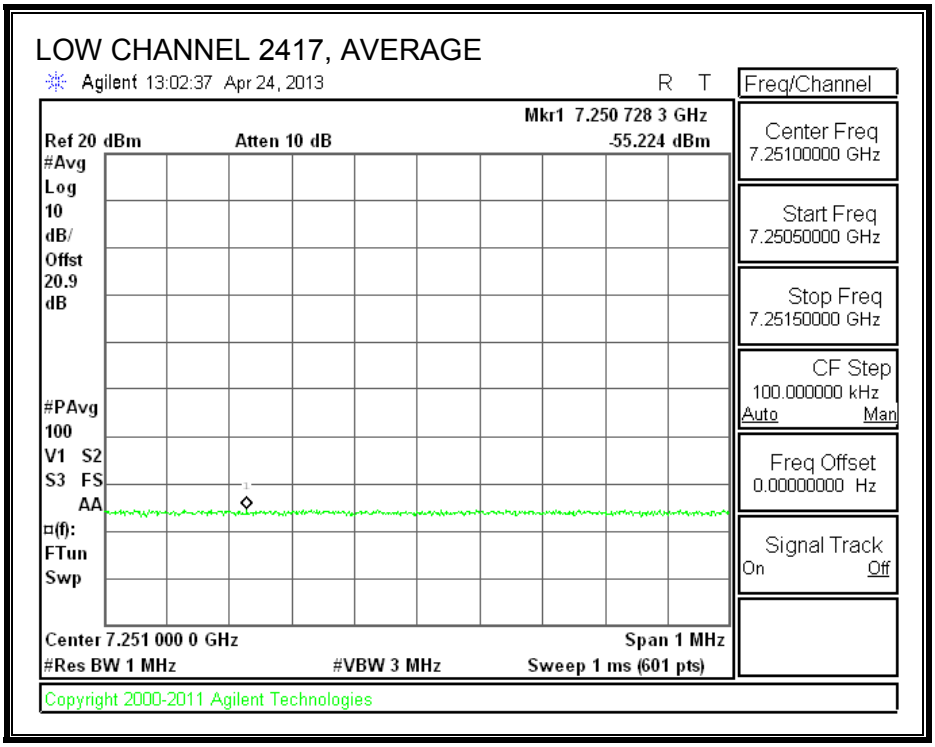

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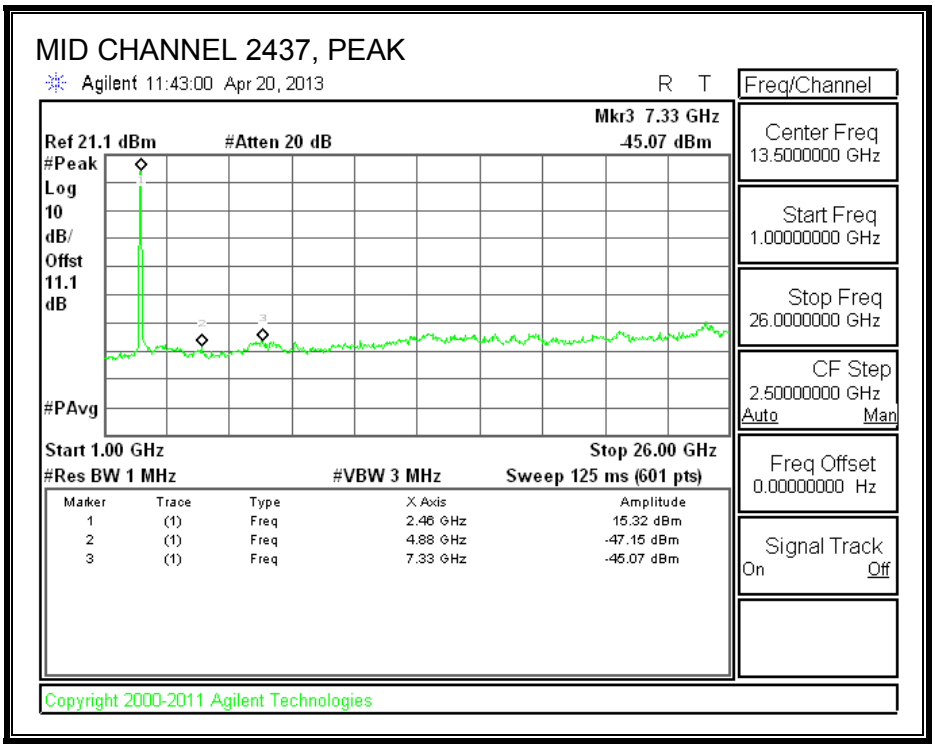

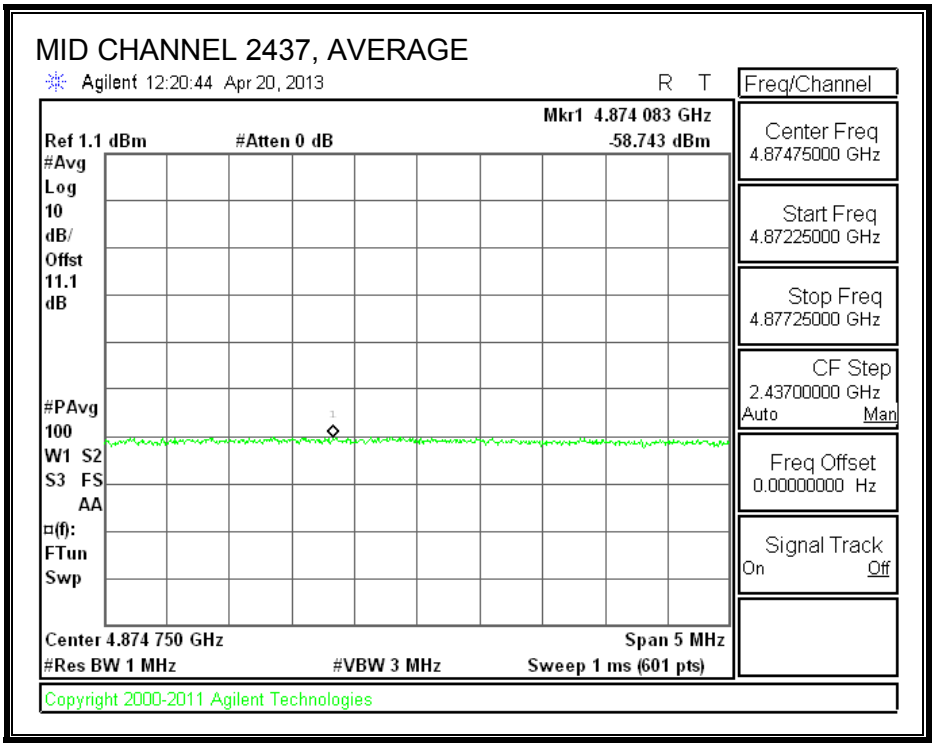

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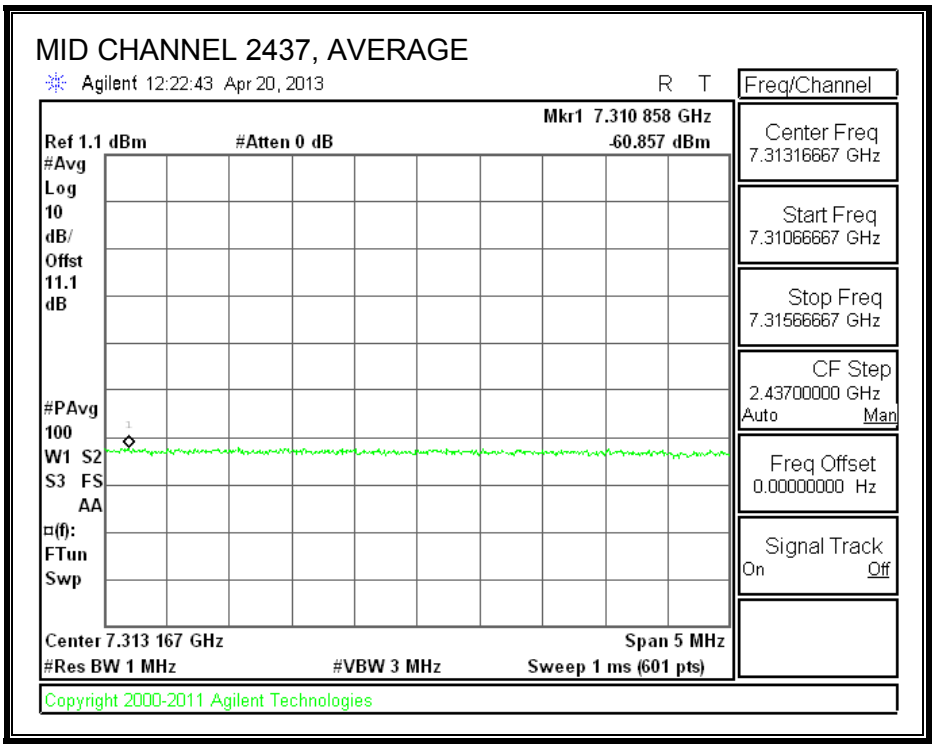
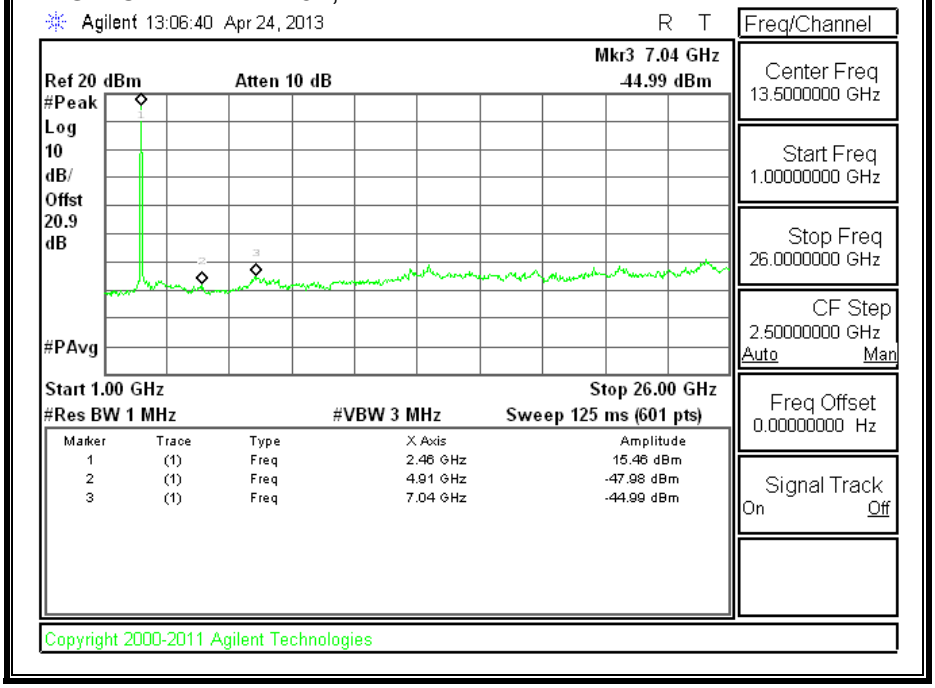
MID CHANNEL 2437, AVERAGE



HIGH CHANNEL 2457, PEAK



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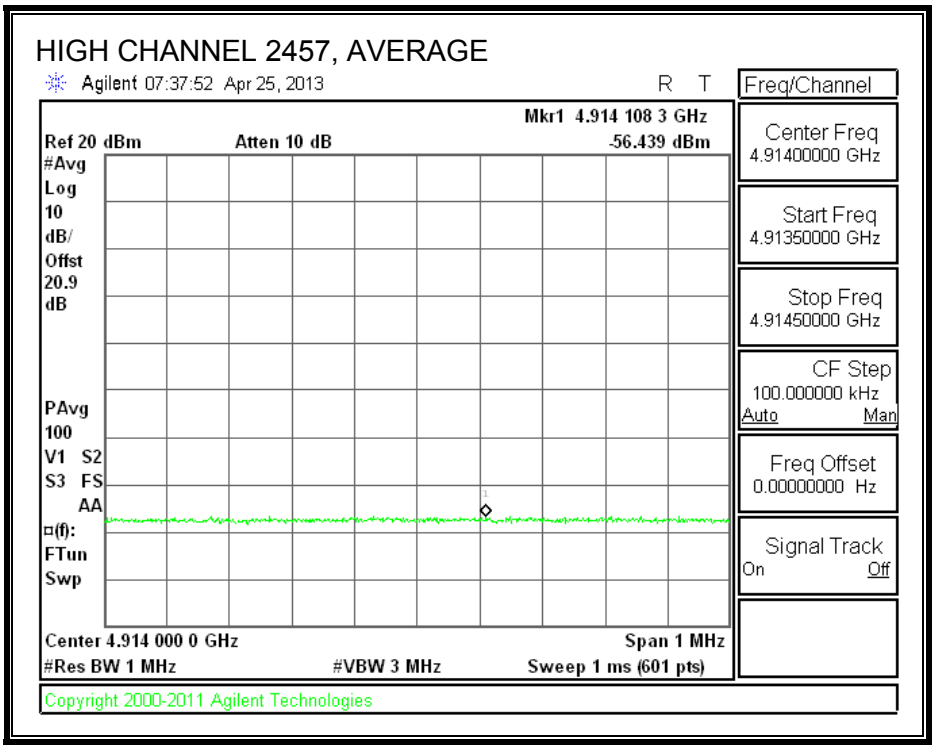

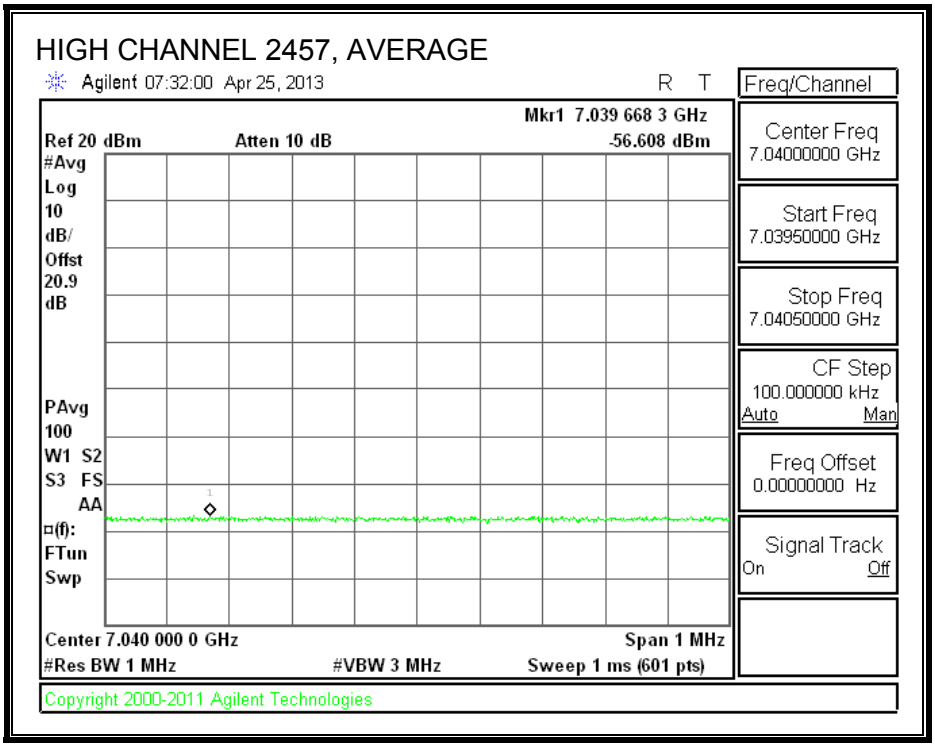

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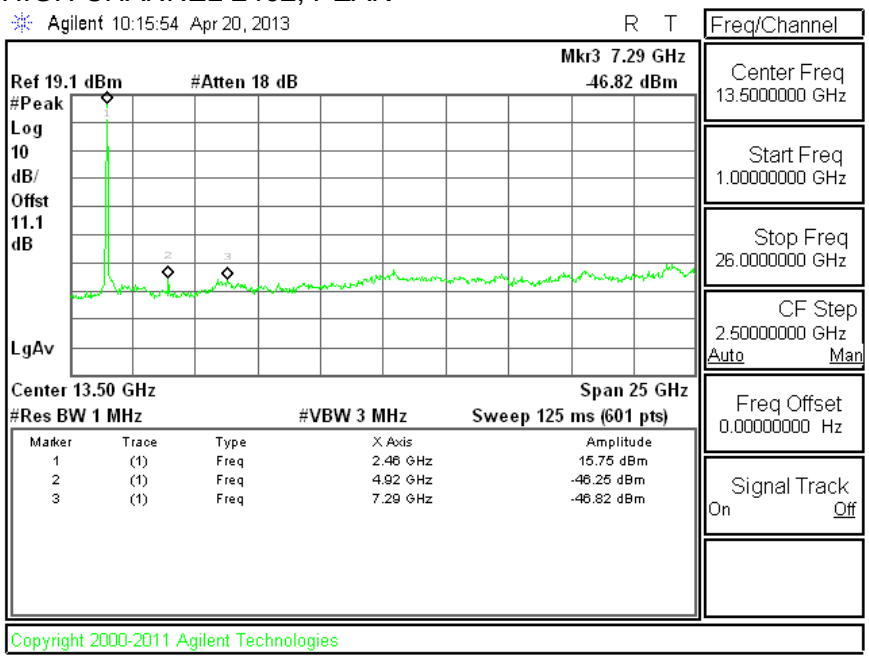
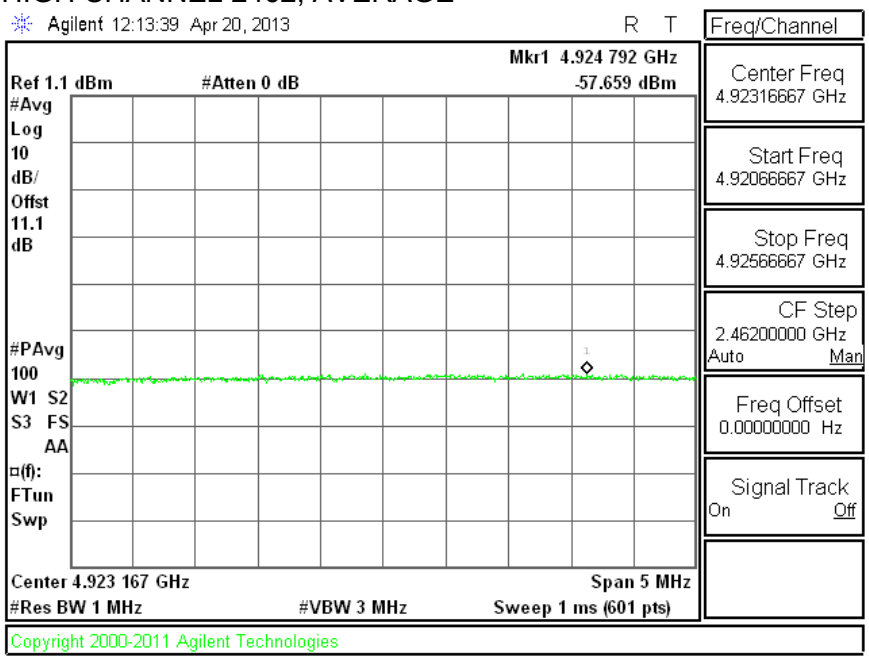
HIGH CHANNEL 2462, PEAK



HIGH CHANNEL 2462, AVERAGE



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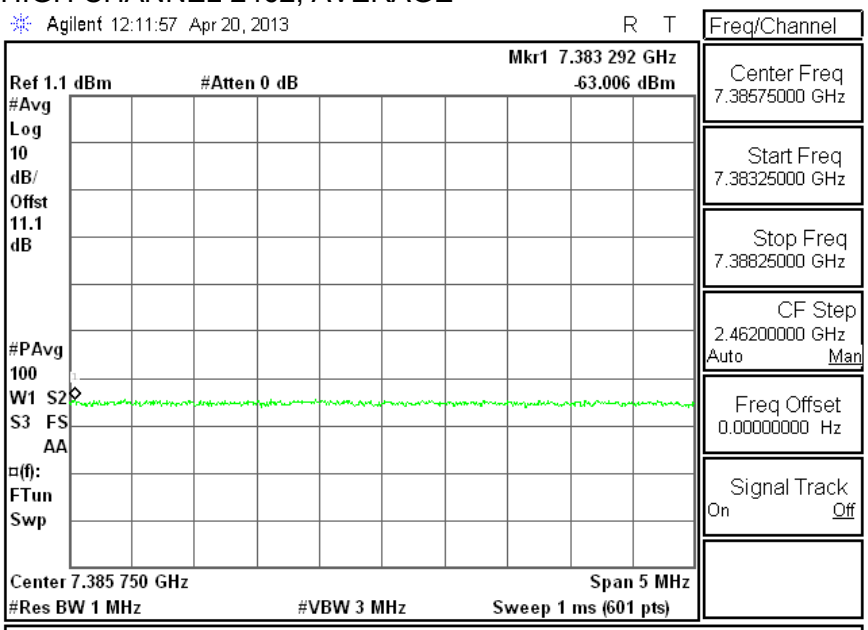
HIGH CHANNEL 2462, AVERAGE



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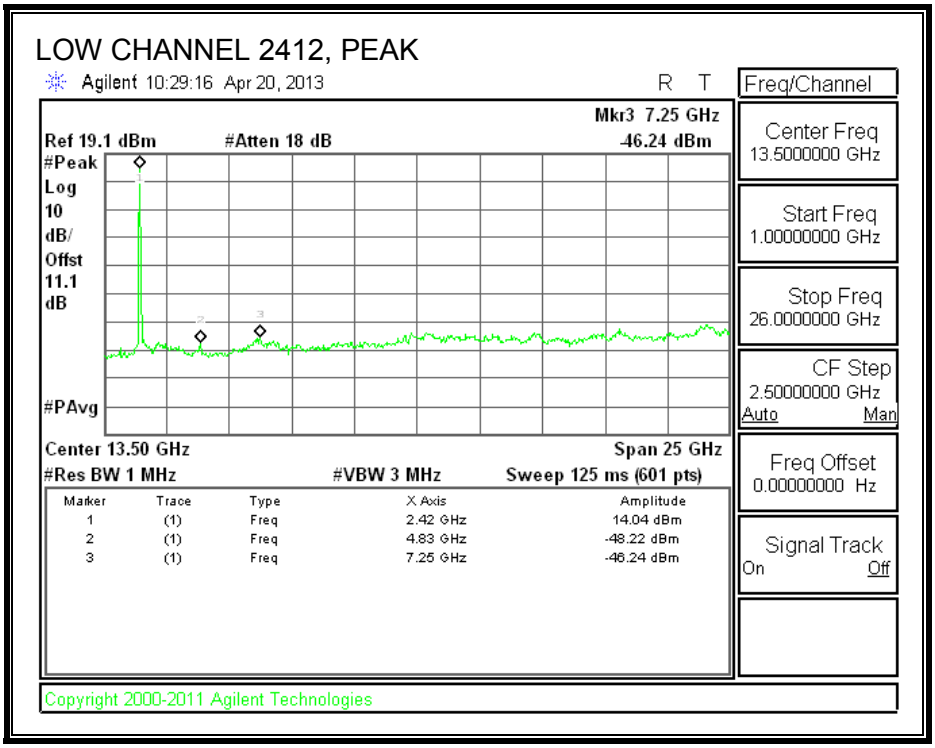
Chain 1

RESTRICTED BANDEDGE (LOW CHANNEL)



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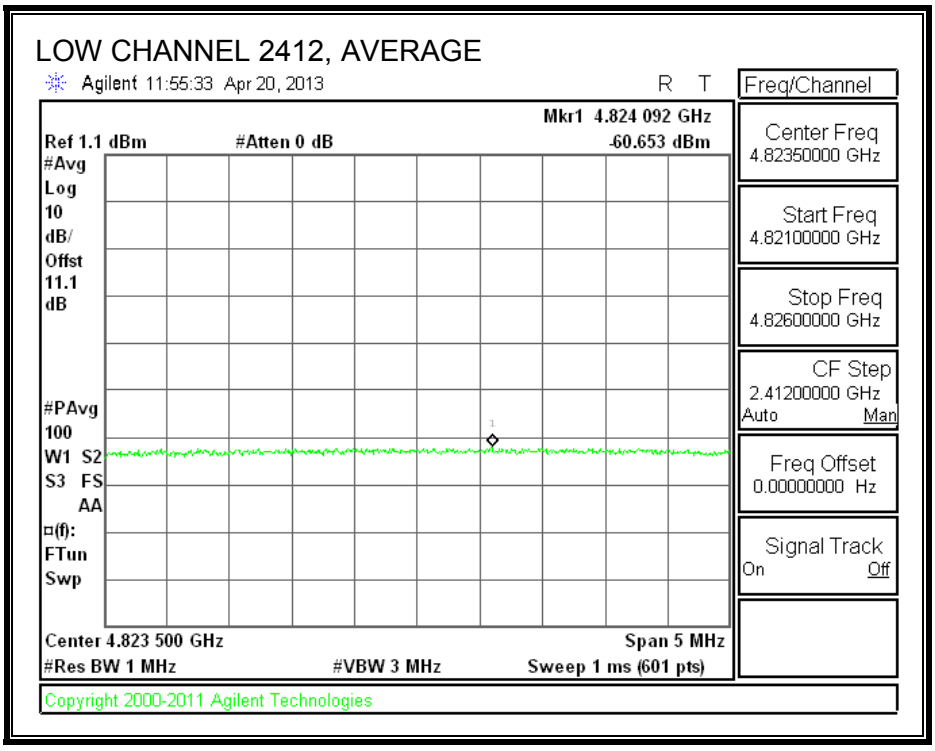

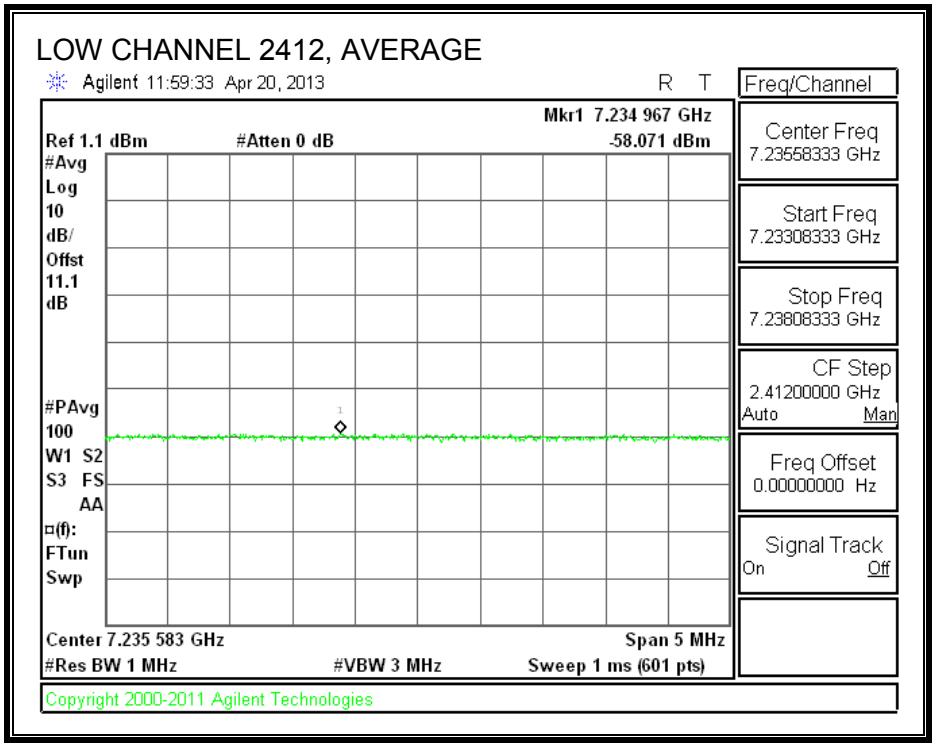

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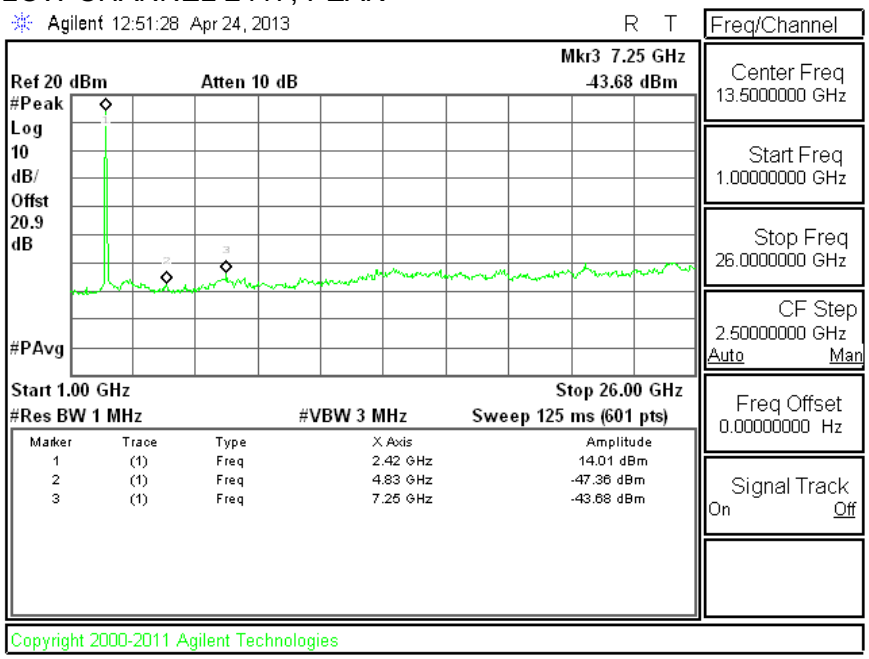
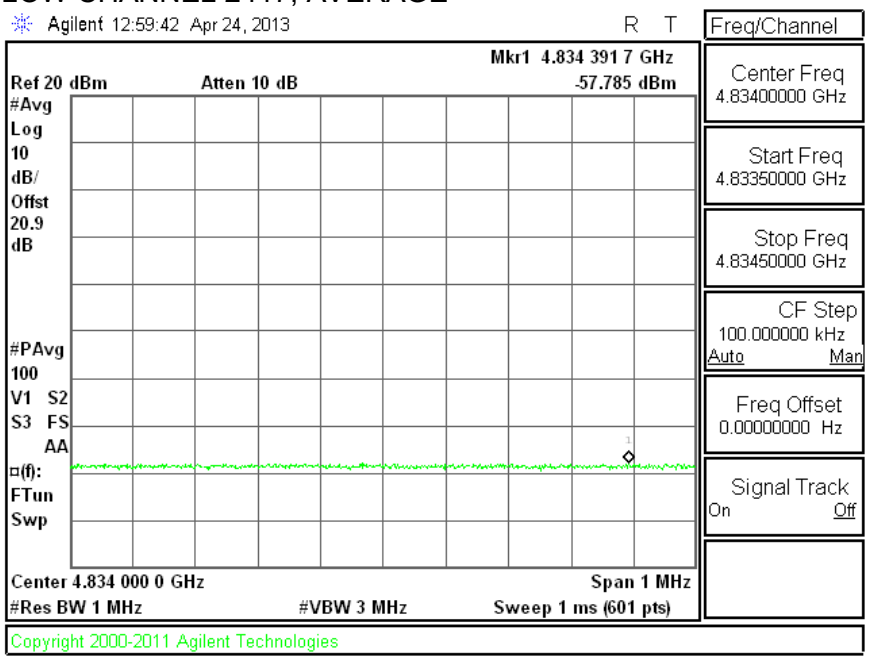
LOW CHANNEL 2417, PEAK



LOW CHANNEL 2417, AVERAGE



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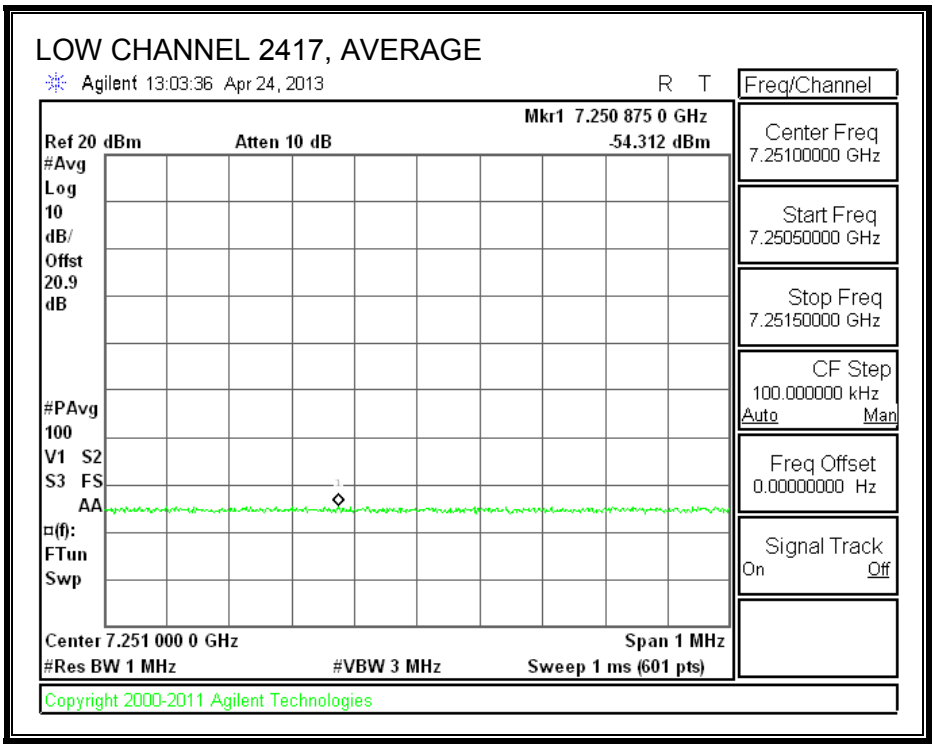
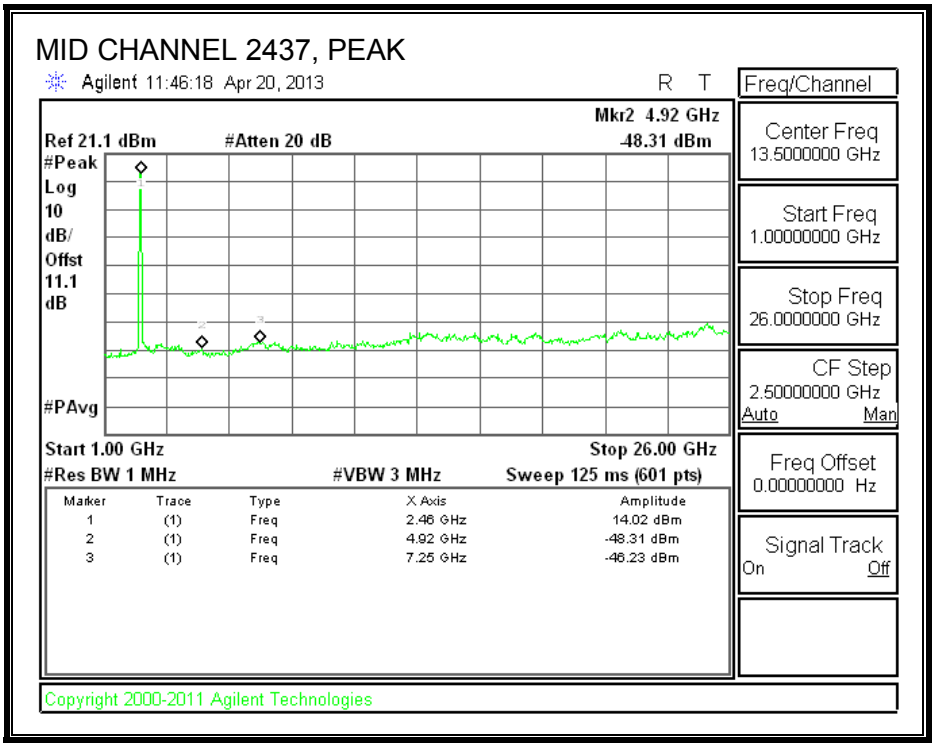
LOW CHANNEL 2417, AVERAGE



MID CHANNEL 2437, PEAK



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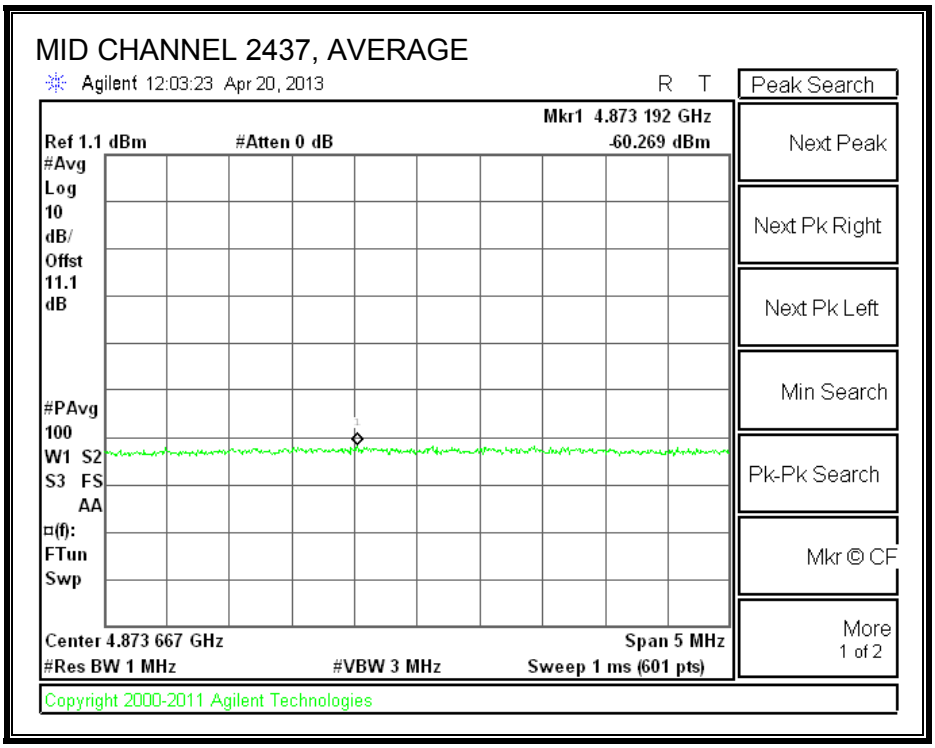

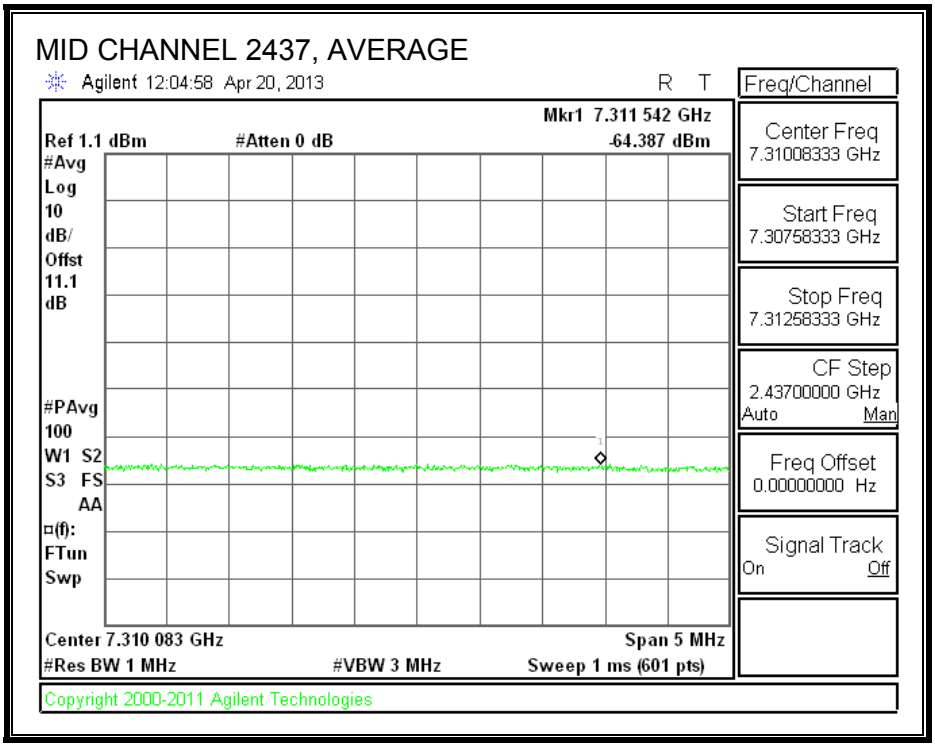

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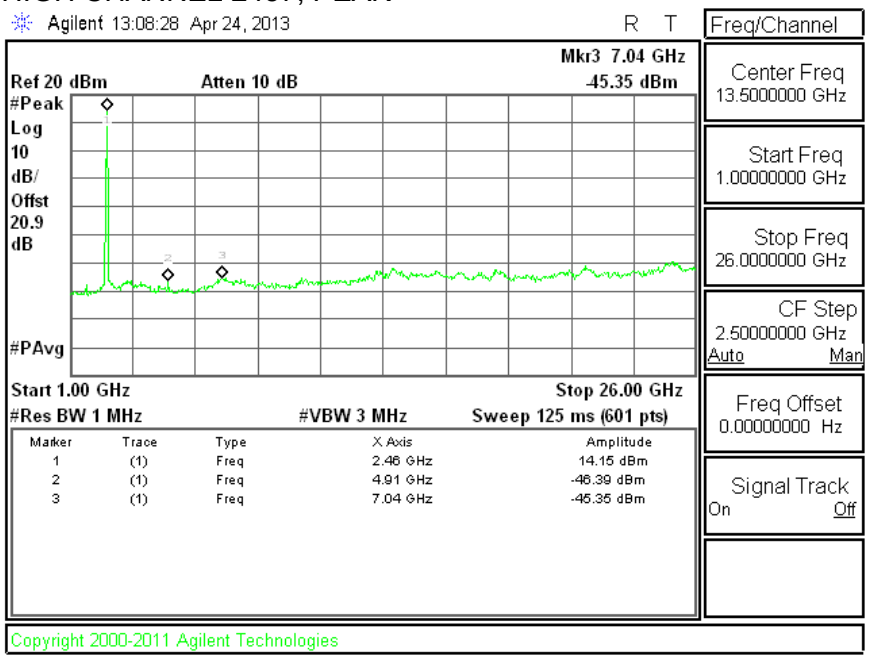
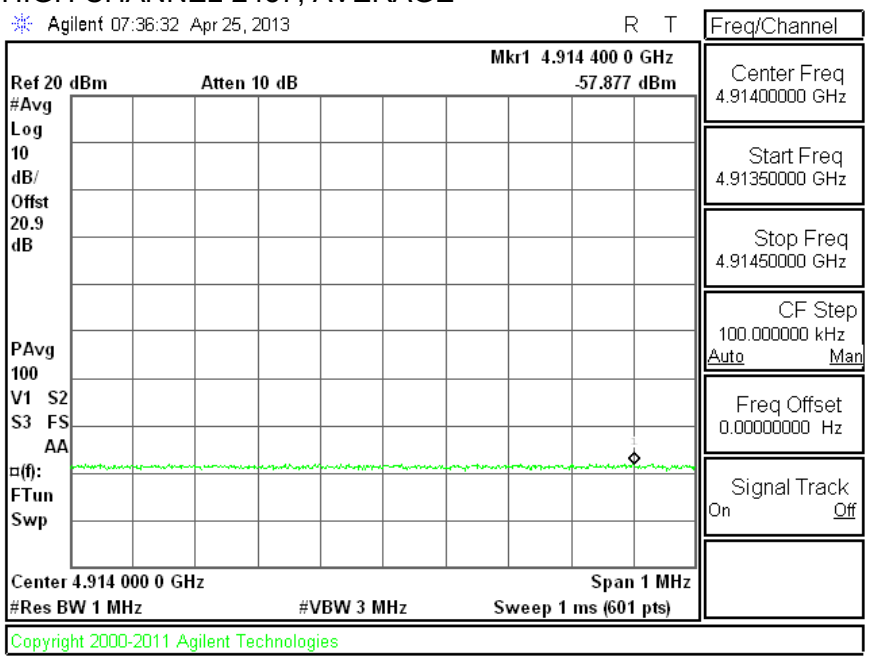
HIGH CHANNEL 2457, PEAK



HIGH CHANNEL 2457, AVERAGE



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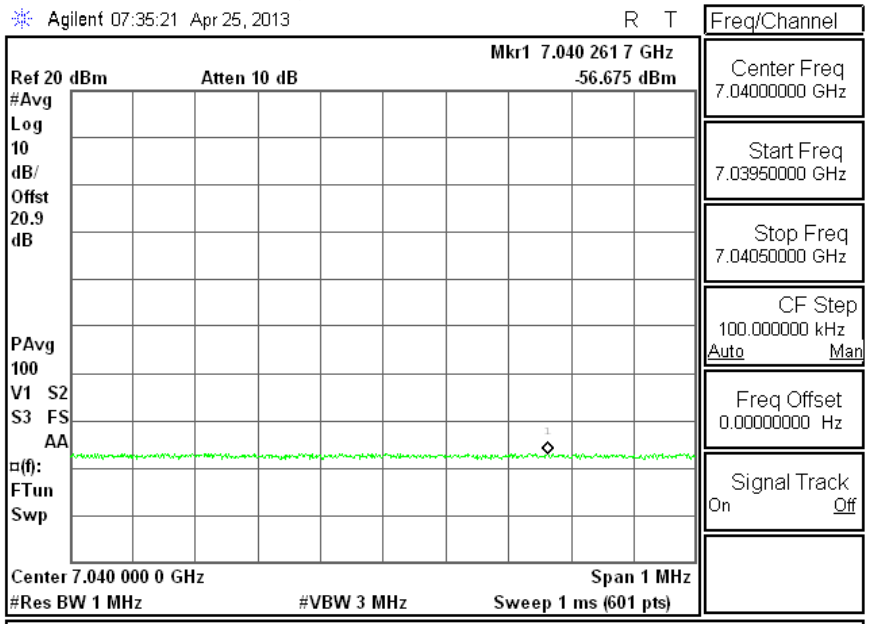
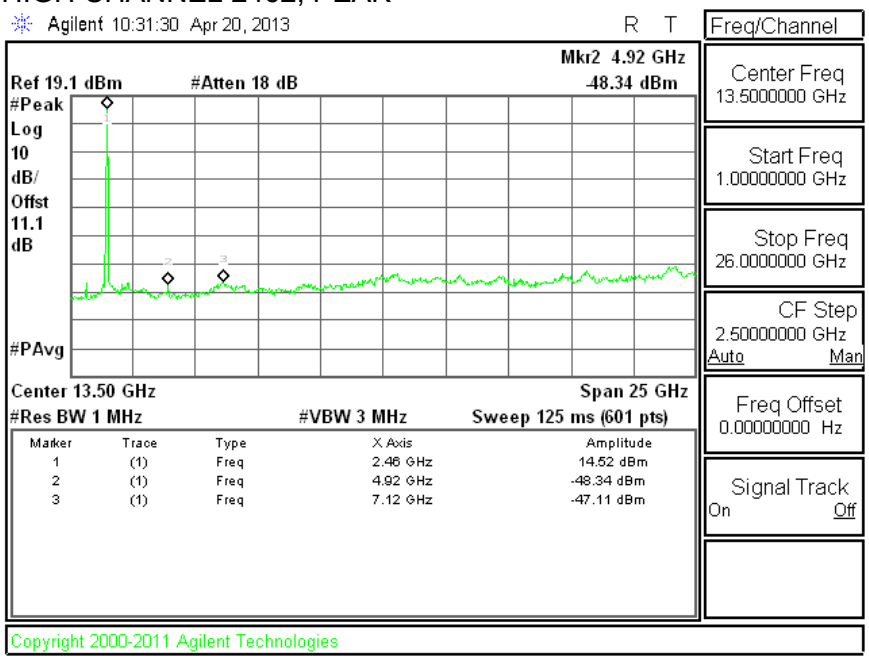
HIGH CHANNEL 2457, AVERAGE



HIGH CHANNEL 2462, PEAK



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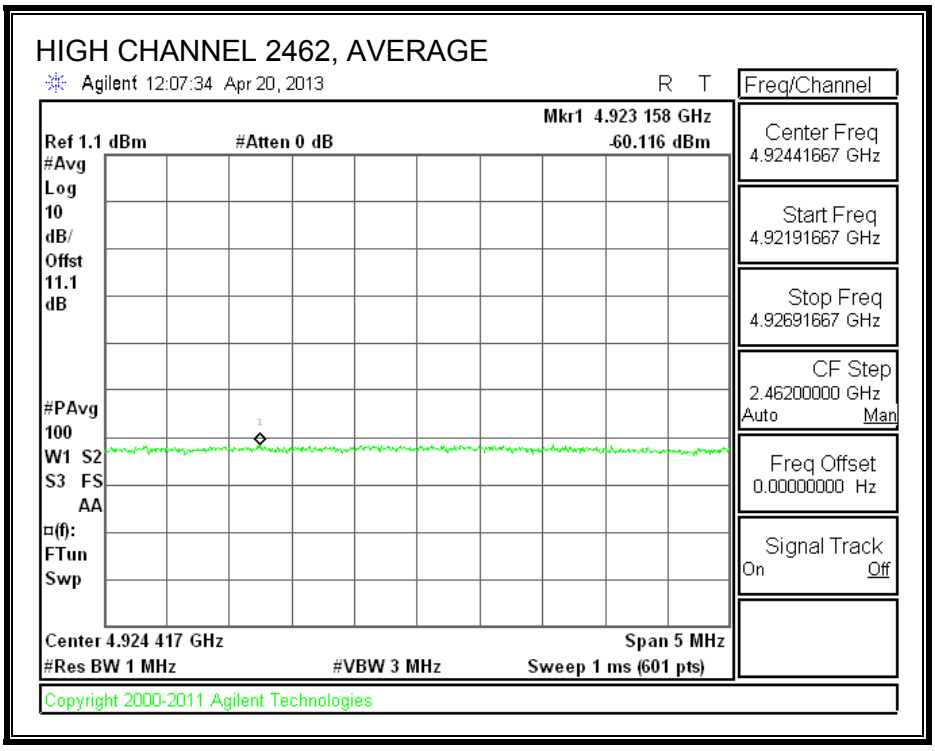

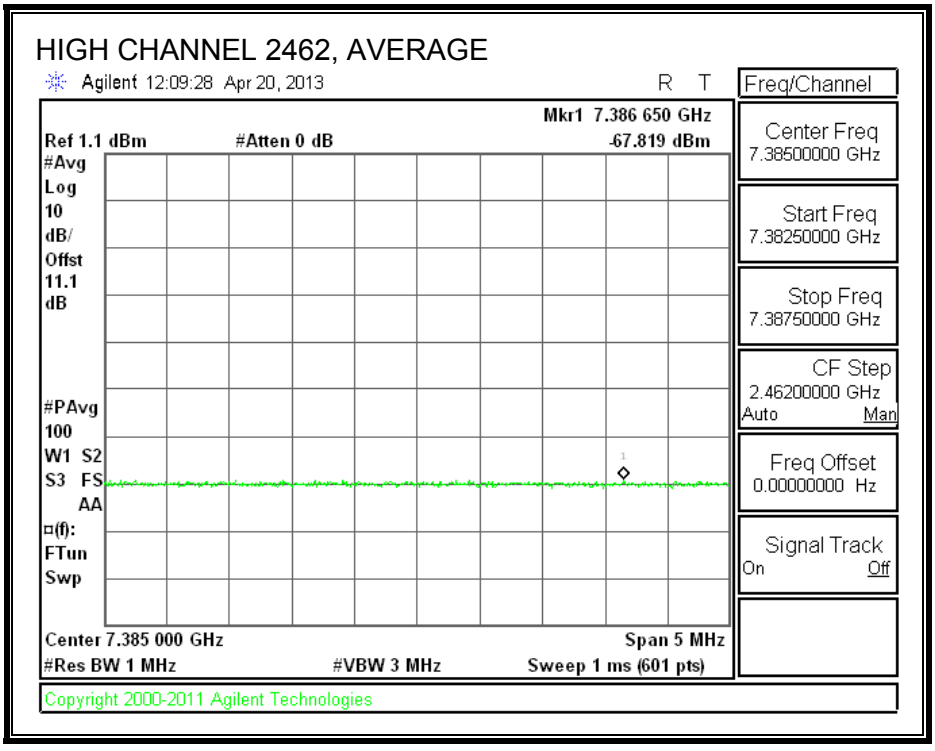

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BANDEDGE DATA

2TX Conducted Spurious BE for FCC DTS (in the restricted bands)

Date:	4/25/2013
Test Engineer:	Oliver Su / T. Wagoner
Client:	Qualcomm Atheros
Project Number:	13U14995
Configuration:	Tx
Mode of operation:	11g 2.4GHz

Note: if the PK margin is greater than 20 dB, there is no need to get AVG reading.

Channel	Frequency (MHz)	PSA PK Reading Chain 0 (dBm)	PSA PK Reading Chain 1 (dBm)	AG/Chain (dBi)	PK EIRP (dBm)	PK E-field Limit (dBm)	PK E-field Margin (dB)	Software Setting	AVG Power Meter Reading (dBm)
1 (2412)	2390	-31.33	-29.59	2	-22.35	-21.2	-1.15	11.50	10.0 / 10.7
2 (2417)	2389	-35.41	-30.59	2	-24.34	-21.2	-3.14	15.00	14 / 14.2
10 (2457)	2483	-29.03	-31.18	2	-21.95	-21.2	-0.75	16.00	16.3 / 15
11 (2462)	2483	-28.95	-35.17	2	-23.01	-21.2	-1.81	11.50	12.4 / 10.6

Channel	Frequency (MHz)	PSA AVG Reading Chain 0 (dBm)	PSA AVG Reading Chain 1 (dBm)	AG/Chain (dBi)	AVG EIRP (dBm)	AVG E-field Limit (dBm)	AVG E-field Margin (dB)	Software Setting	AVG Power Meter Reading (dBm)
1 (2412)	2390	-51.269	-48.953	2	-41.94	-41.2	-0.74	9.50	8.2 / 8.2
2 (2417)	2389	-51.574	-48.767	2	-41.93	-41.2	-0.73	13.50	13 / 13
10 (2457)	2483	-48.765	-50.686	2	-41.60	-41.2	-0.40	14.00	14.5 / 12.8
11 (2462)	2483	-50.854	-52.19	2	-43.45	-41.2	-2.25	9.50	9.3 / 8.7

Note: Duty Cycle Correction Factor already added. DCCF= 0.127

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HARMONIC SPURIOUS DATA

2TX Conducted Spurious for FCC DTS (in the restricted bands)

Date:	4/24/2013
Test Engineer:	Oliver Su / T. Wagoner
Client:	Qualcomm Atheros
Project Number:	13U14995
Configuration:	Tx
Mode of operation:	11g 2.4GHz

Note: if the PK margin is greater than 20 dB, there is no need to get AVG reading.

Channel	Frequency (MHz)	PSA PK Reading Chain 0 (dBm)	PSA PK Reading Chain 1 (dBm)	AG/Chain (dBi)	PK EIRP (dBm)	PK E-field Limit (dBm)	PK E-field Margin (dB)	Software Setting	AVG Power Meter Reading (dBm)
1 (2412)	4824	-47.2	-48.09	2	-39.60	-21.2	-18.40	18.00	18.7 / 17.6
1 (2412)	7236	-46.95	-46.11	2	-38.49	-21.2	-17.29	18.00	18.7 / 17.6
2 (2417)	4834	-48.03	-47.23	2	-39.59	-21.2	-18.39	18.00	17 / 17
2 (2417)	7251	-45.6	-43.55	2	-36.43	-21.2	-15.23	18.00	17 / 17
6 (2437)	4874	-47.02	-48.18	2	-39.54	-21.2	-18.34	18.00	18.7 / 17.6
6 (2437)	7311	-44.94	-46.1	2	-37.46	-21.2	-16.26	18.00	18.7 / 17.6
10 (2457)	4914	-47.85	-46.26	2	-38.96	-21.2	-17.76	18.00	17.95 / 17
10 (2457)	7040	-44.86	-45.22	2	-37.02	-21.2	-15.82	18.00	17.95 / 17
11 (2462)	4924	-46.12	-48.21	2	-39.02	-21.2	-17.82	18.00	18.7 / 17.6
11 (2462)	7386	-46.69	-46.98	2	-38.81	-21.2	-17.61	18.00	18.7 / 17.6

Channel	Frequency (MHz)	PSA AVG Reading Chain 0 (dBm)	PSA AVG Reading Chain 1 (dBm)	AG/Chain (dBi)	AVG EIRP (dBm)	AVG E-field Limit (dBm)	AVG E-field Margin (dB)	Software Setting	AVG Power Meter Reading (dBm)
1 (2412)	4824	-60.128	-60.523	2	-52.30	-41.2	-11.10	18.00	18.7 / 17.6
1 (2412)	7236	-58.296	-57.941	2	-50.09	-41.2	-8.89	18.00	18.7 / 17.6
2 (2417)	4834	-57.117	-57.655	2	-49.36	-41.2	-8.16	18.00	17 / 17
2 (2417)	7251	-55.094	-54.182	2	-46.59	-41.2	-5.39	18.00	17 / 17
6 (2437)	4874	-58.613	-60.139	2	-51.29	-41.2	-10.09	18.00	18.7 / 17.6
6 (2437)	7311	-60.727	-64.257	2	-54.12	-41.2	-12.92	18.00	18.7 / 17.6
10 (2457)	4914	-56.309	-57.747	2	-48.95	-41.2	-7.75	18.00	17.95 / 17
10 (2457)	7040	-56.478	-56.545	2	-48.49	-41.2	-7.29	18.00	17.95 / 17
11 (2462)	4924	-57.529	-59.986	2	-50.57	-41.2	-9.37	18.00	18.7 / 17.6
11 (2462)	7386	-62.876	-67.689	2	-56.63	-41.2	-15.43	18.00	18.7 / 17.6

Note: Duty Cycle Correction Factor already added. DCCF= 0.127

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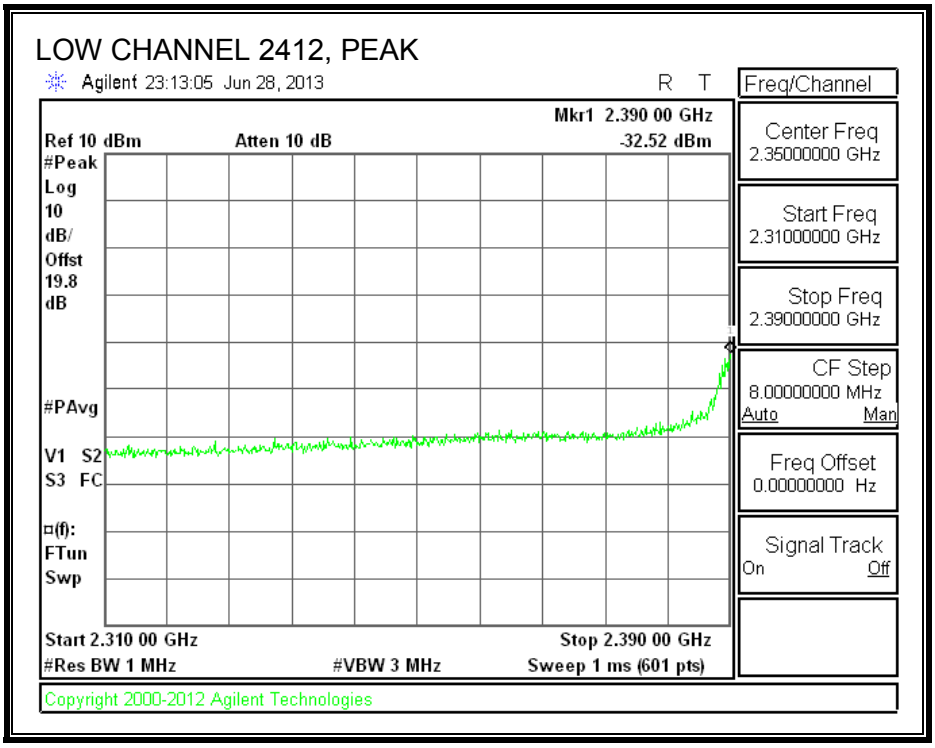
8.2.8. CONDUCTED BE AND SPURIOUS IN RESTRICTED BANDS (3G filter unit)

RESTRICTED BANDEDGE
Chain 0



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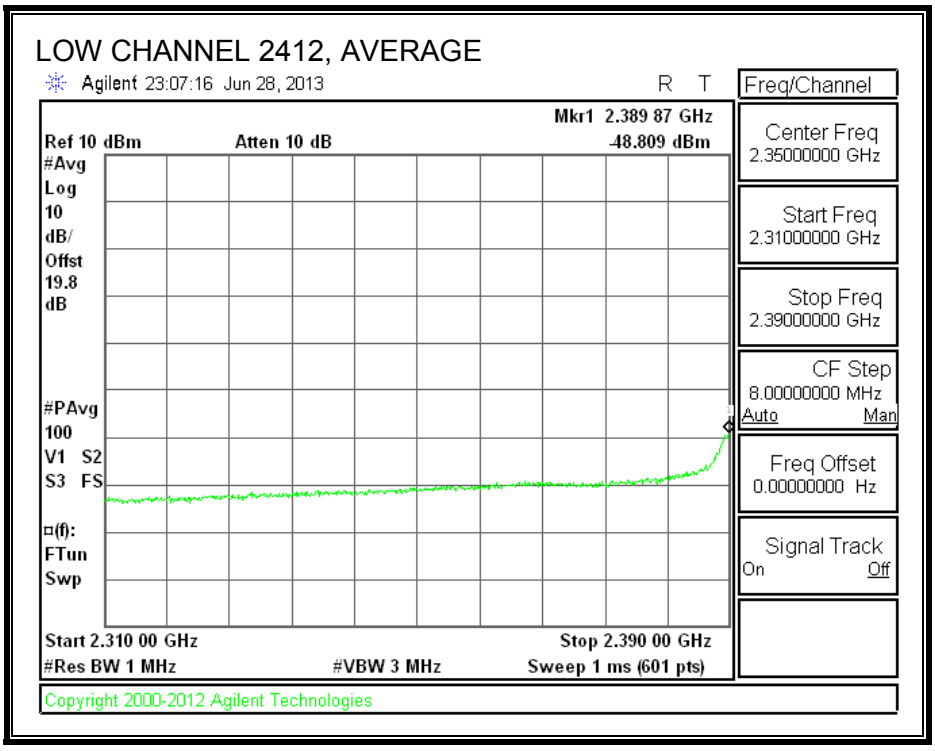
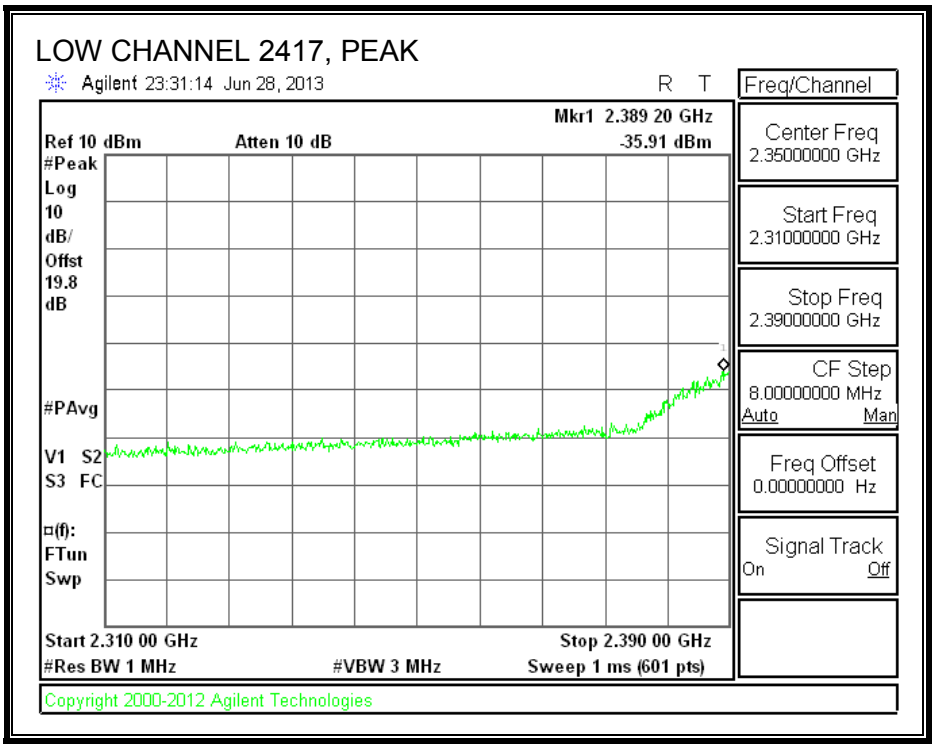
LOW CHANNEL 2412, AVERAGE



LOW CHANNEL 2417, PEAK



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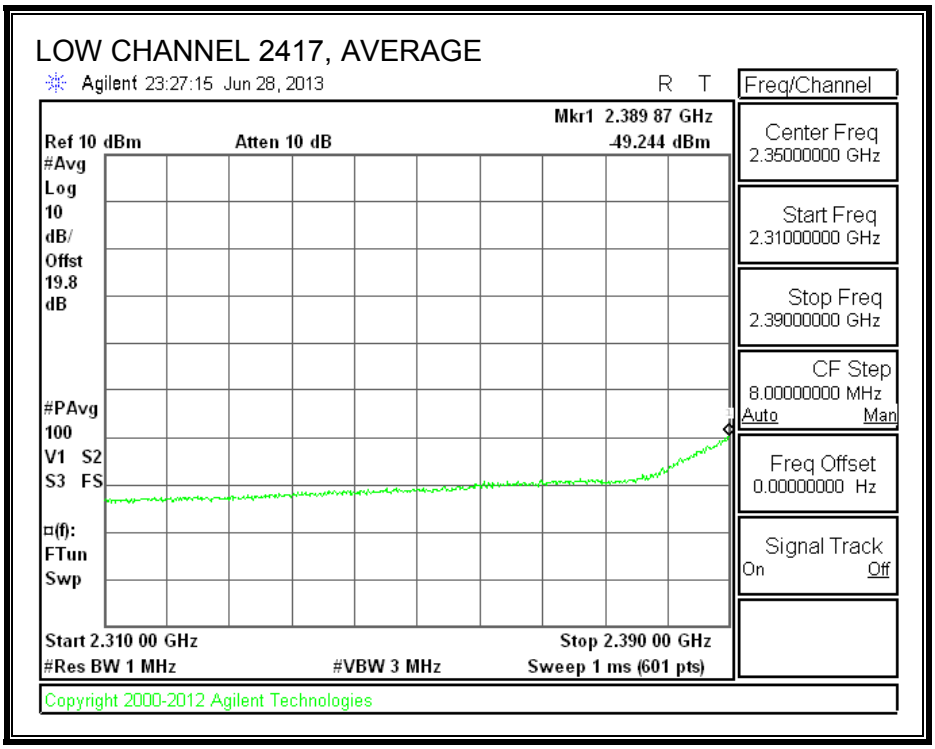

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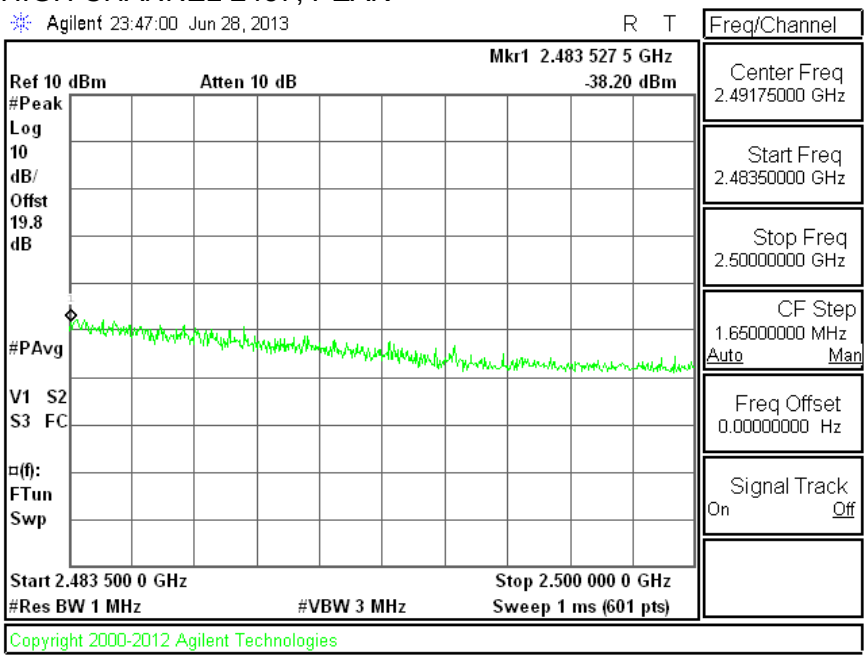
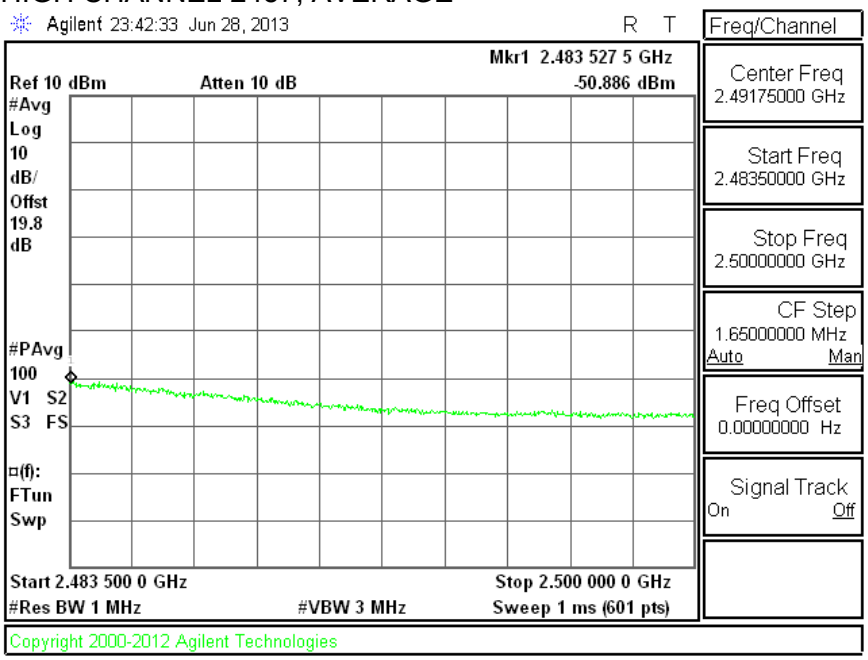
HIGH CHANNEL 2457, PEAK



HIGH CHANNEL 2457, AVERAGE



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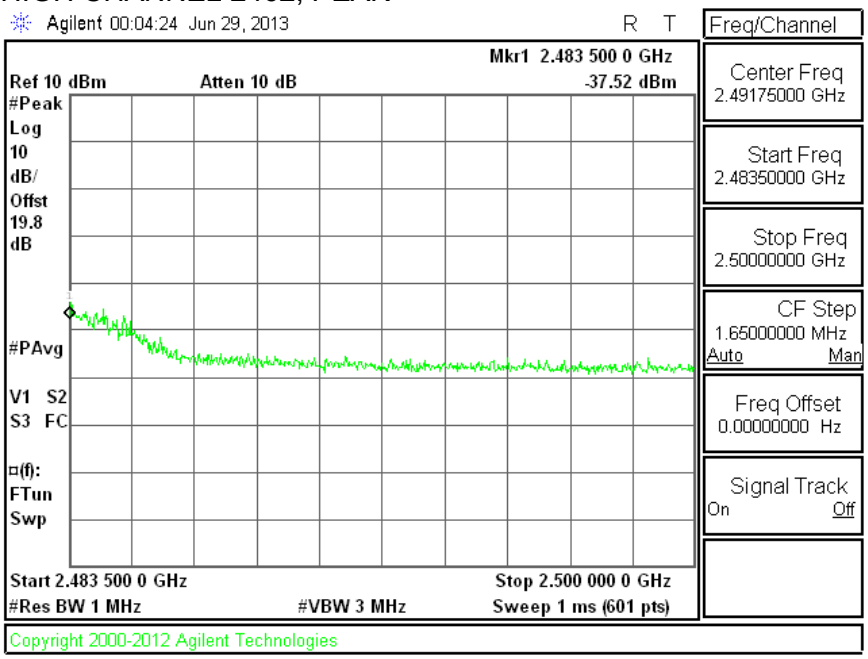
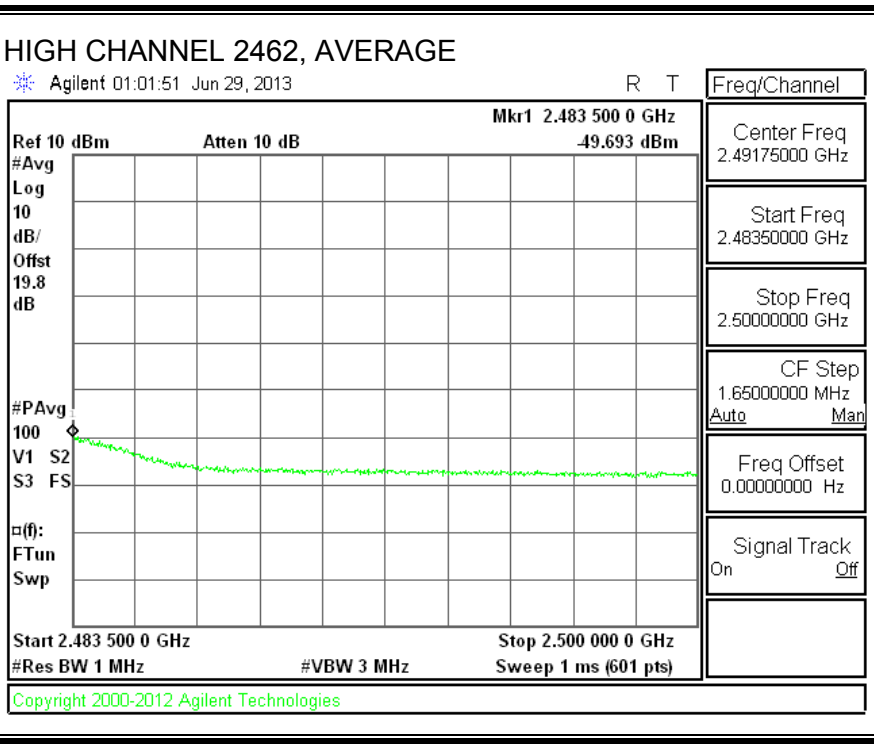
HIGH CHANNEL 2462, PEAK



HIGH CHANNEL 2462, AVERAGE



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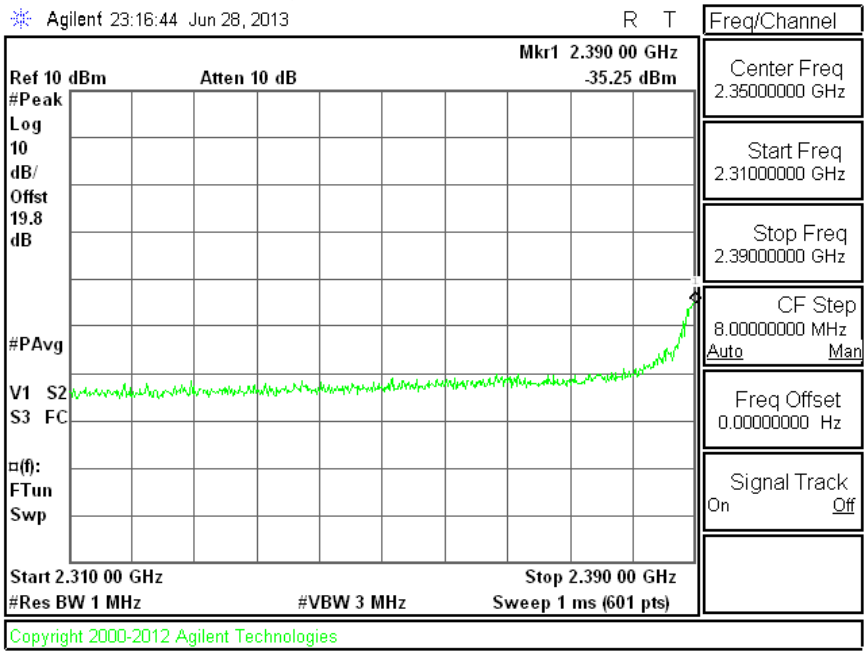
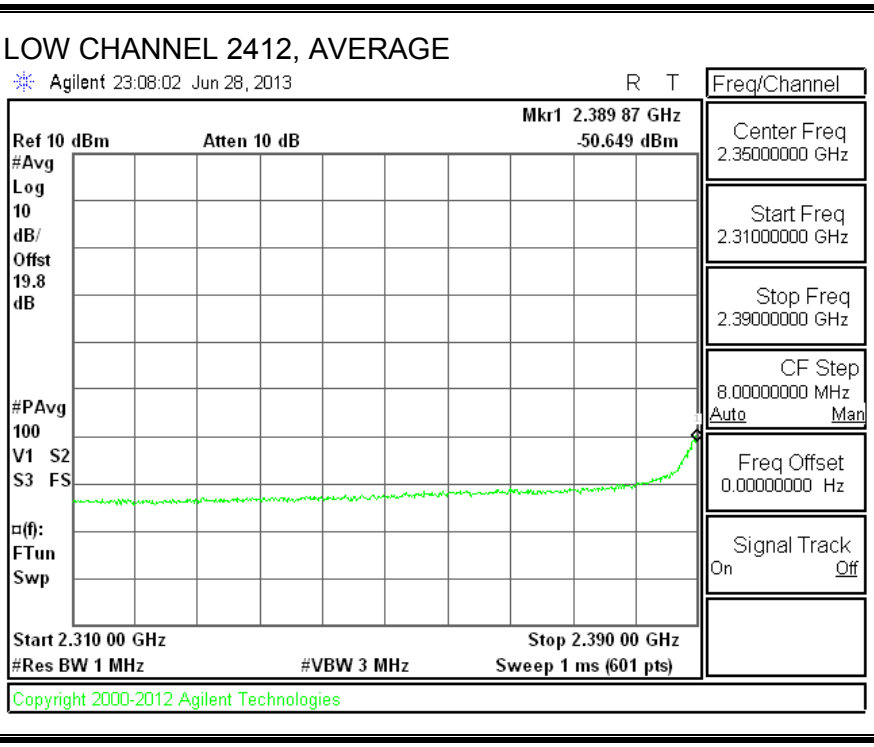
Chain 1

LOW CHANNEL 2412, PEAK



LOW CHANNEL 2412, AVERAGE



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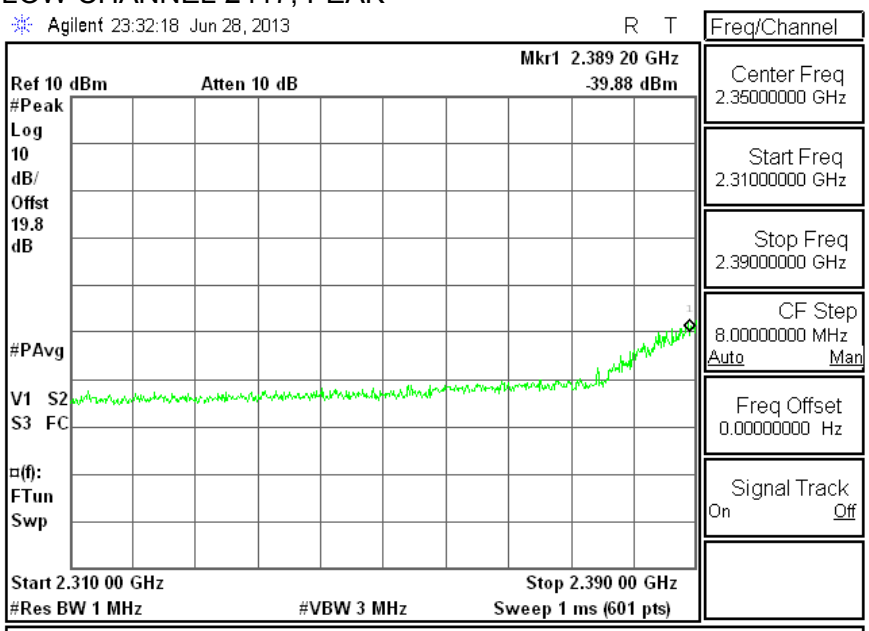
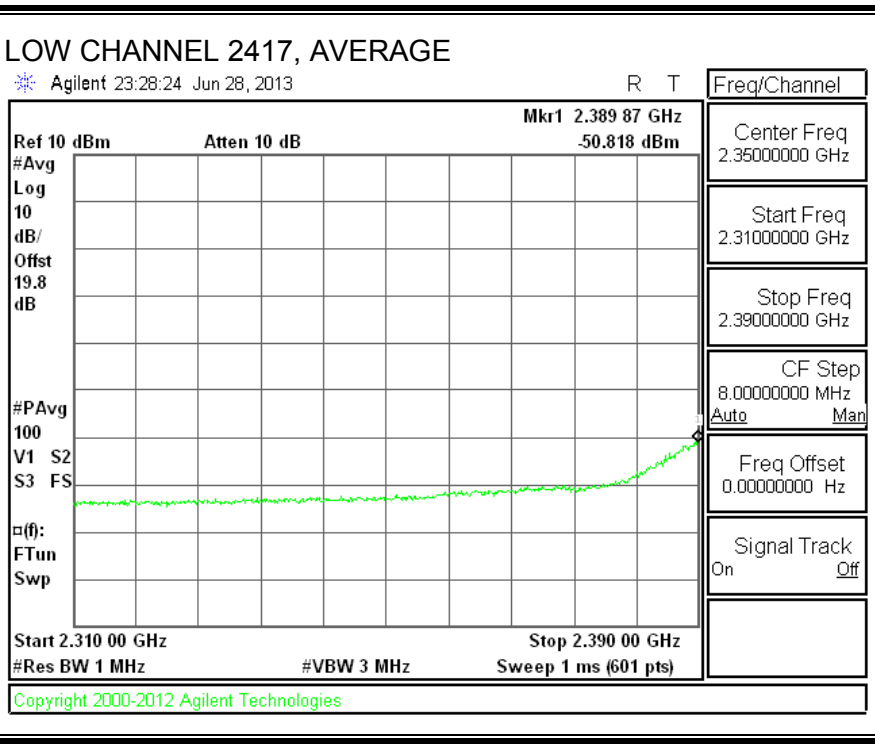
LOW CHANNEL 2417, PEAK



LOW CHANNEL 2417, AVERAGE



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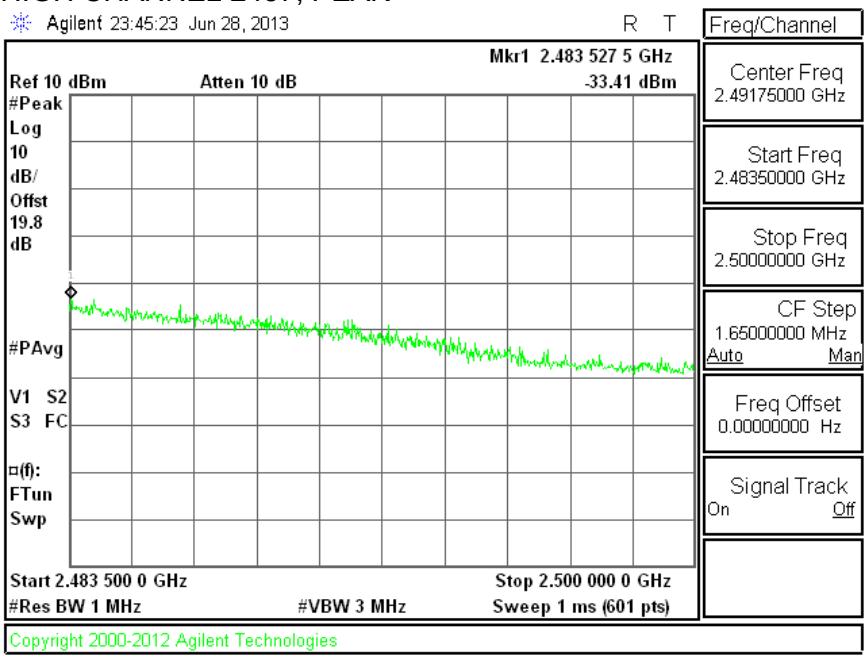
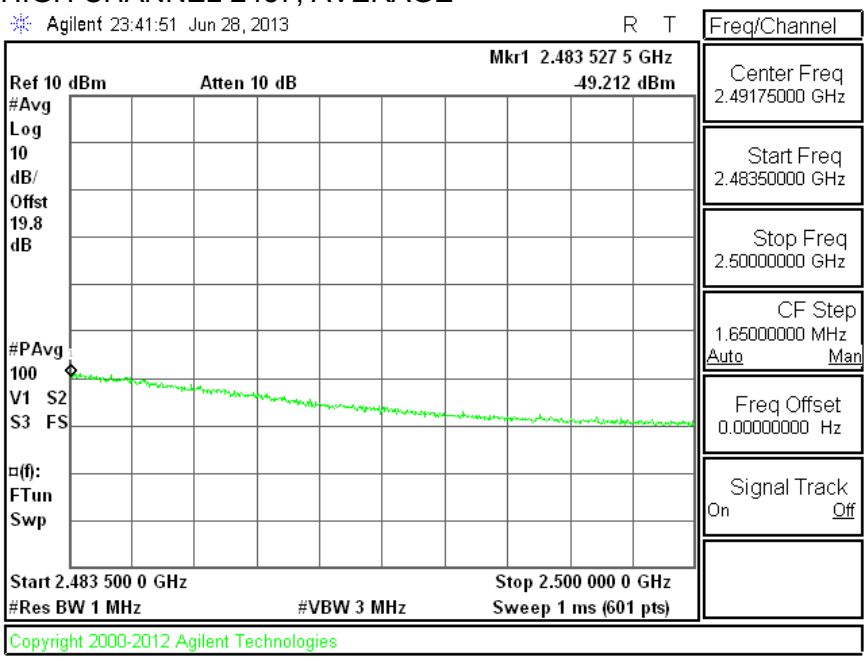
HIGH CHANNEL 2457, PEAK



HIGH CHANNEL 2457, AVERAGE



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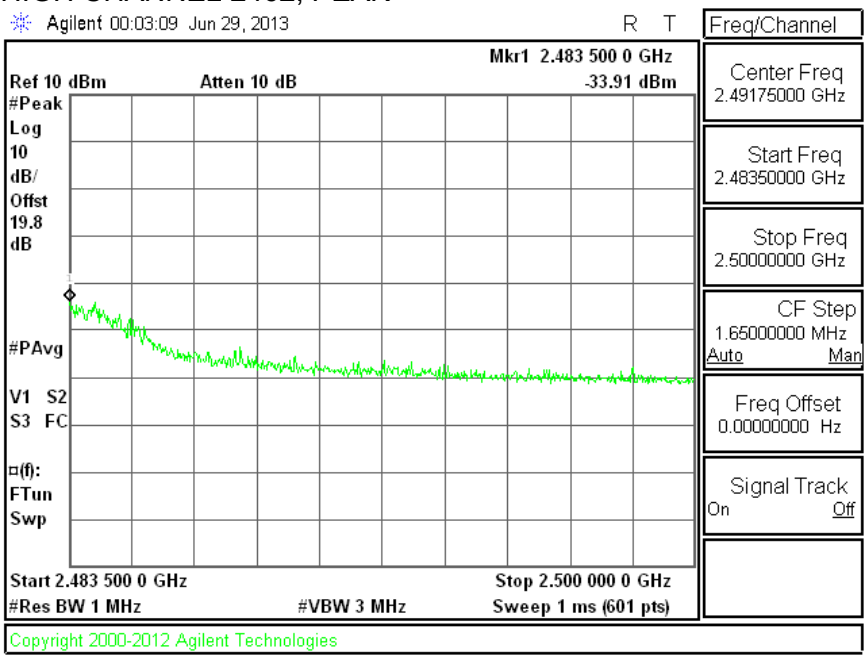
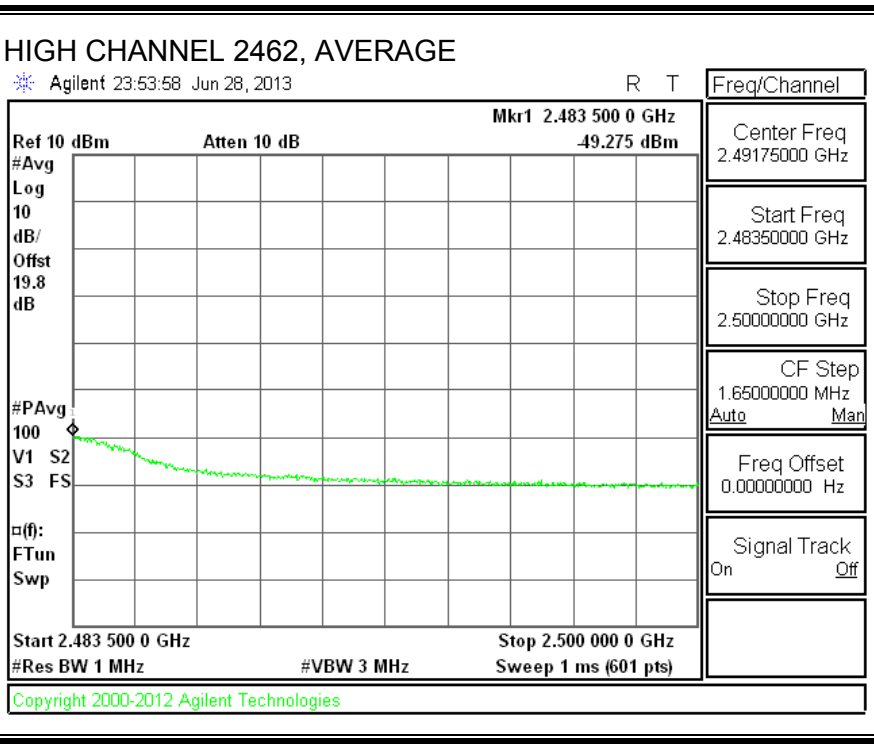
HIGH CHANNEL 2462, PEAK



HIGH CHANNEL 2462, AVERAGE



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BANDEDGE DATA

2TX Conducted BE for FCC DTS (in the restricted bands)	
Date:	6/29/2013
Test Engineer:	Chris Xiong
Client:	Qualcomm Atheros
Project Number:	13U14995
Configuration:	TX
Mode of operation:	11g

Note: if the PK margin is greater than 20 dB, there is no need to get AVG reading.

Channel	Frequency (GHz)	PSA PK Reading Chain 0 (dBm)	PSA PK Reading Chain 1 (dBm)	AG/Chain (dBi)	PK EIRP (dBm)	PK E-field Limit (dBm)	PK E-field Margin (dB)	Software Setting (dBm)	AVG Power Meter Reading - Chain 0 (dBm)	AVG Power Meter Reading - Chain 1 (dBm)
1	2.39	-32.52	-35.25	2	-25.65	-21.2	-4.45	11.50	8.23	7.66
2	2.3892	-35.91	-39.88	2	-29.44	-21.2	-8.24	15.00	11.33	10.77
10	2.4835275	-38.2	-33.41	2	-27.16	-21.2	-5.96	15.50	11.16	11.76
11	2.4835	-37.52	-33.91	2	-27.33	-21.2	-6.13	12.00	7.87	7.97

Channel	Frequency (MHz)	PSA AVG Reading Chain 0 (dBm)	PSA AVG Reading Chain 1 (dBm)	AG/Chain (dBi)	AVG EIRP (dBm)	AVG E-field Limit (dBm)	AVG E-field Margin (dB)	Software Setting (dBm)	AVG Power Meter Reading - Chain 0 (dBm)	AVG Power Meter Reading - Chain 1 (dBm)
1	2.38987	-48.809	-50.649	2	-41.61	-41.2	-0.41	11.50	8.23	7.66
2	2.38987	-49.244	-50.818	2	-41.94	-41.2	-0.74	15.00	11.33	10.77
10	2.4835275	-50.886	-49.212	2	-41.95	-41.2	-0.75	15.50	11.16	11.76
11	2.4835	-49.693	-49.275	2	-41.46	-41.2	-0.26	12.00	7.87	7.97

Note: Duty Cycle Correction Factor already added to PSA for average measurement.
DCCF= 0.127

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8.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

8.3.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	2412	17.685	17.685	0.5
Low	2417	17.685	17.685	0.5
Mid	2437	17.685	17.685	0.5
High	2457	17.685	17.685	0.5
High	2462	17.685	17.685	0.5

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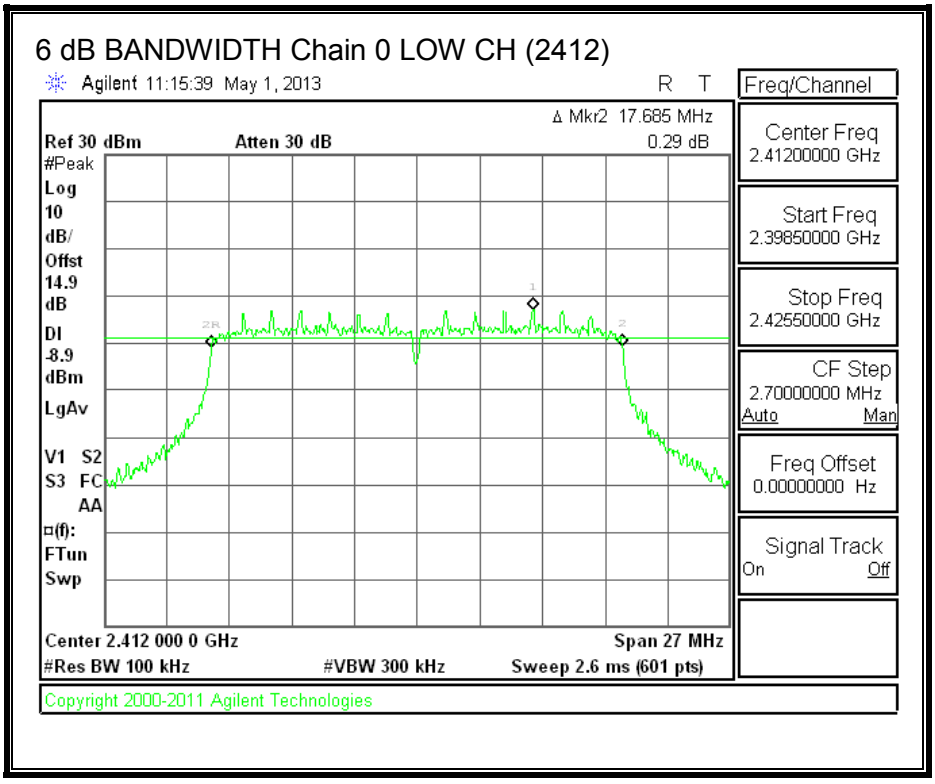
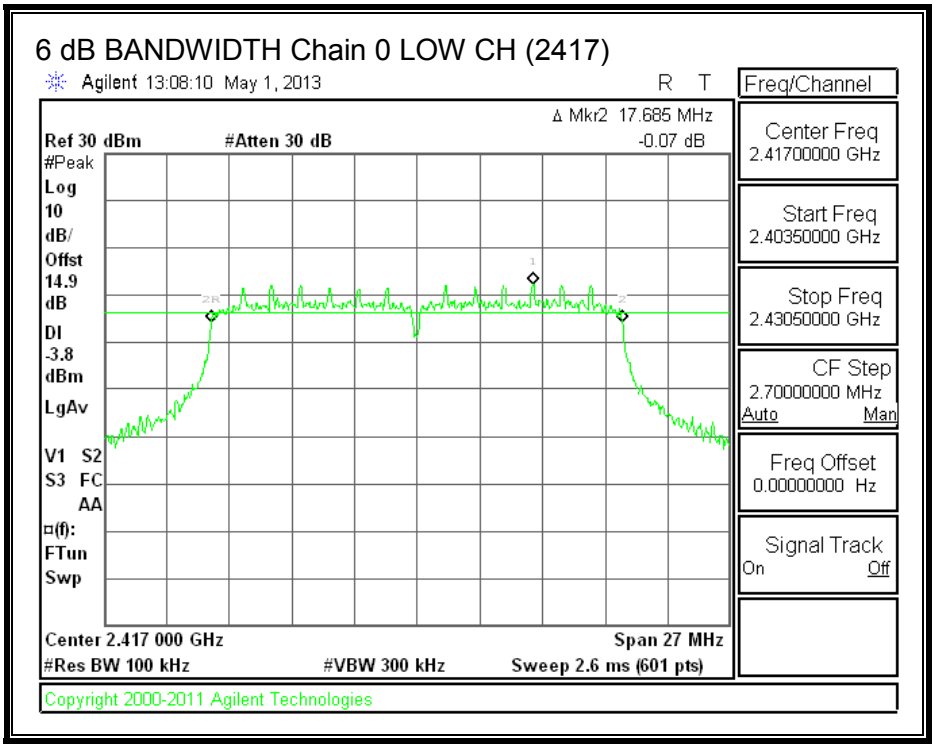
6 dB BANDWIDTH, Chain 0





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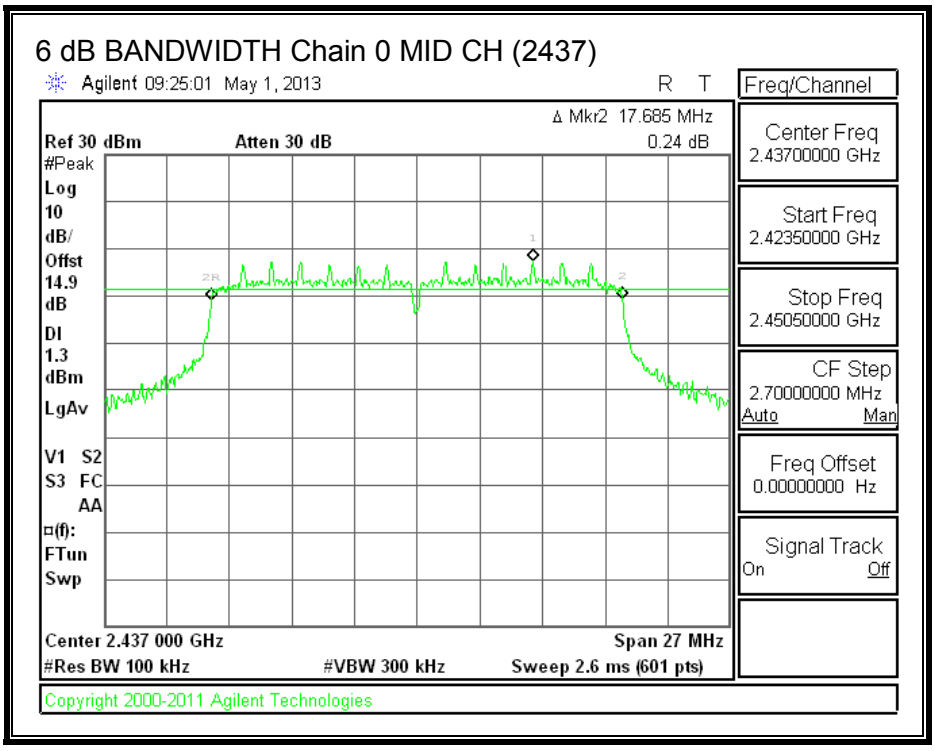

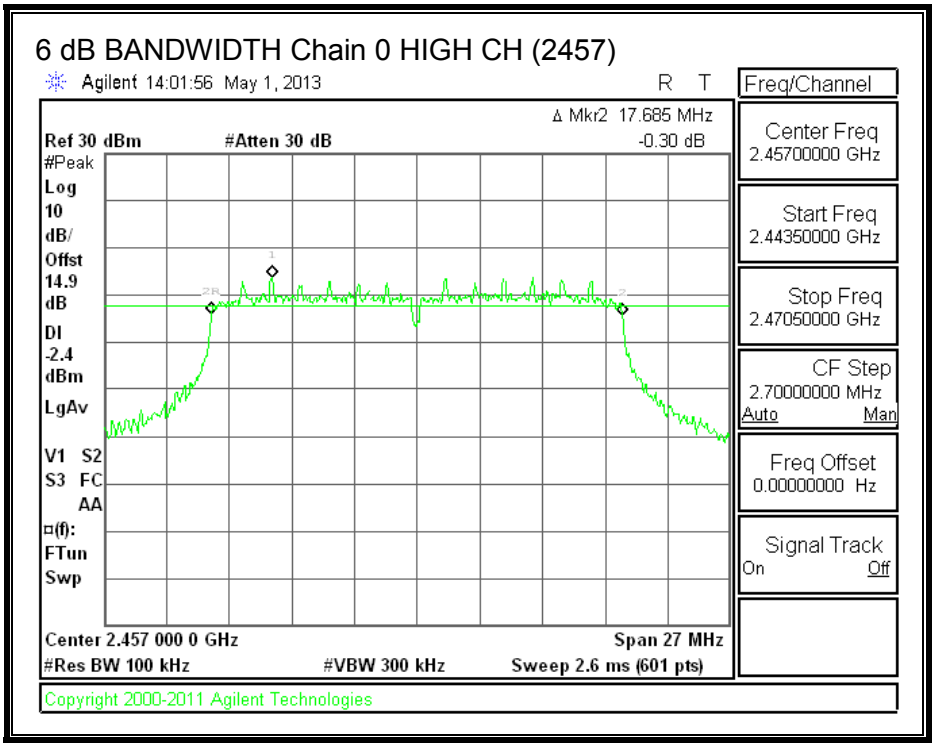

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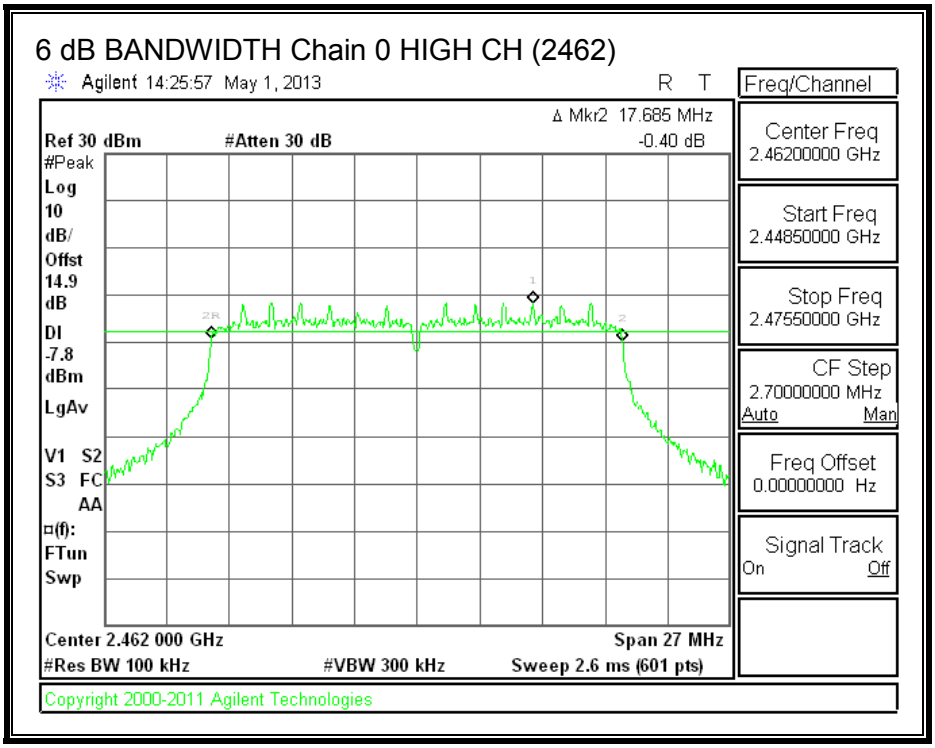
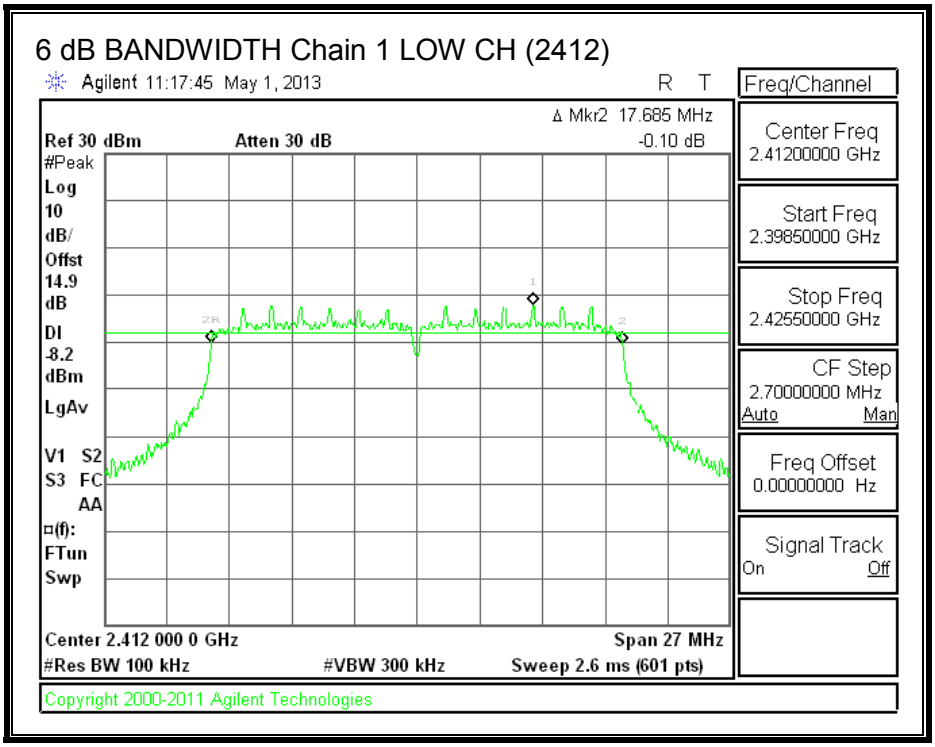


6 dB BANDWIDTH, Chain 1



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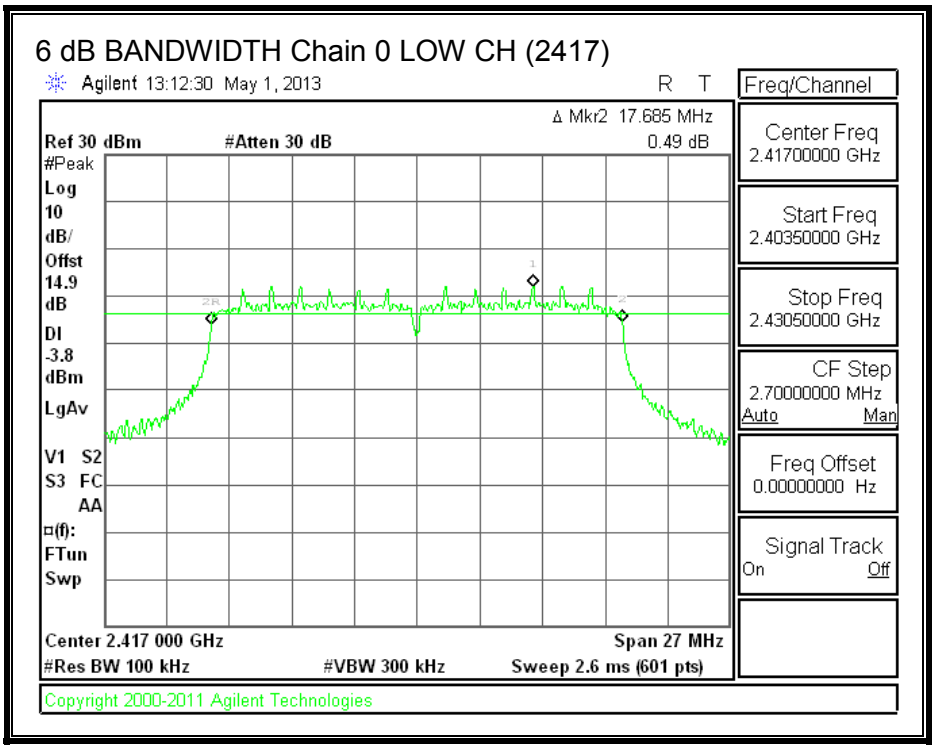

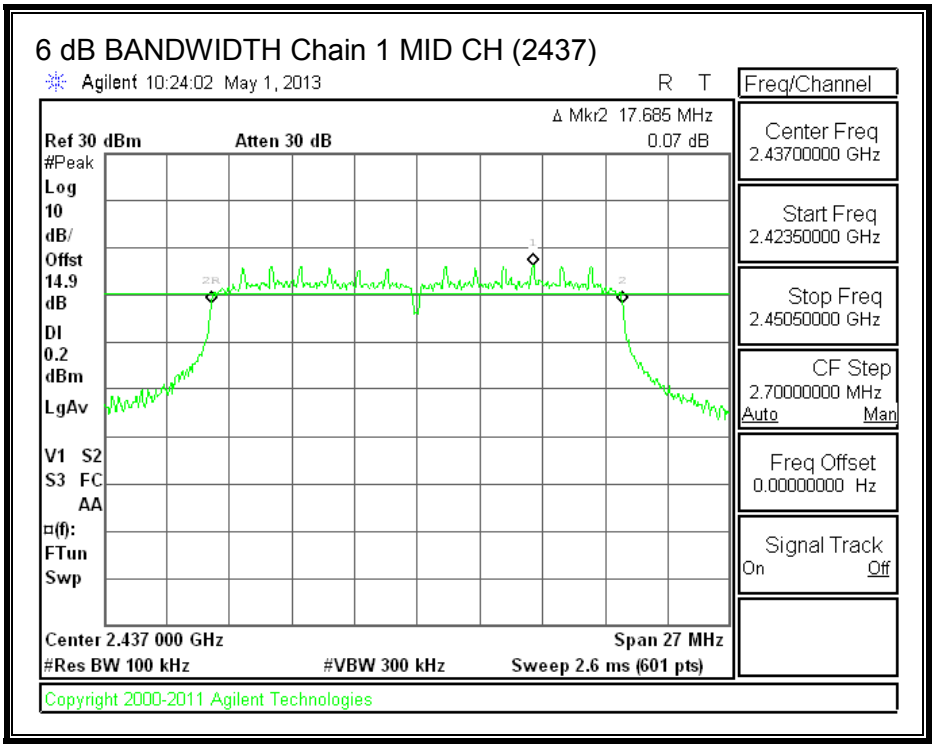

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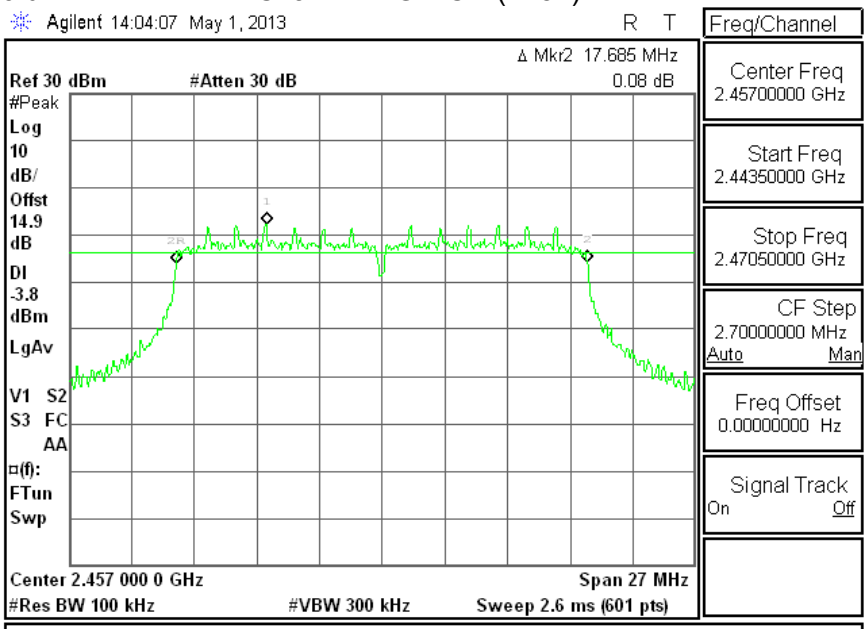
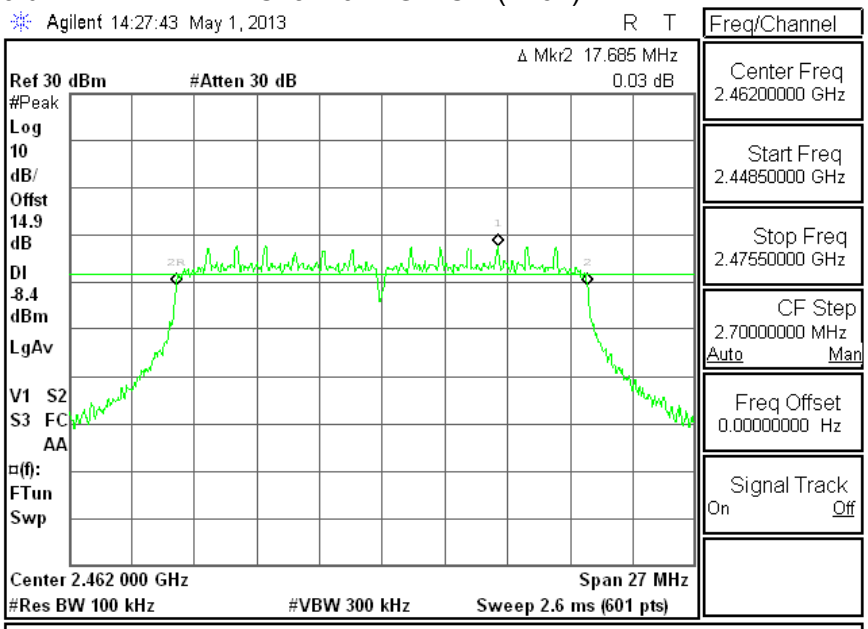
6 dB BANDWIDTH Chain 1 HIGH CH (2457)



6 dB BANDWIDTH Chain 0 HIGH CH (2462)



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8.3.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	2412	17.6283	17.5782
Low	2417	17.6230	17.7226
Mid	2437	17.7241	17.6372
High	2457	17.6021	17.5066
High	2462	17.6738	17.6501

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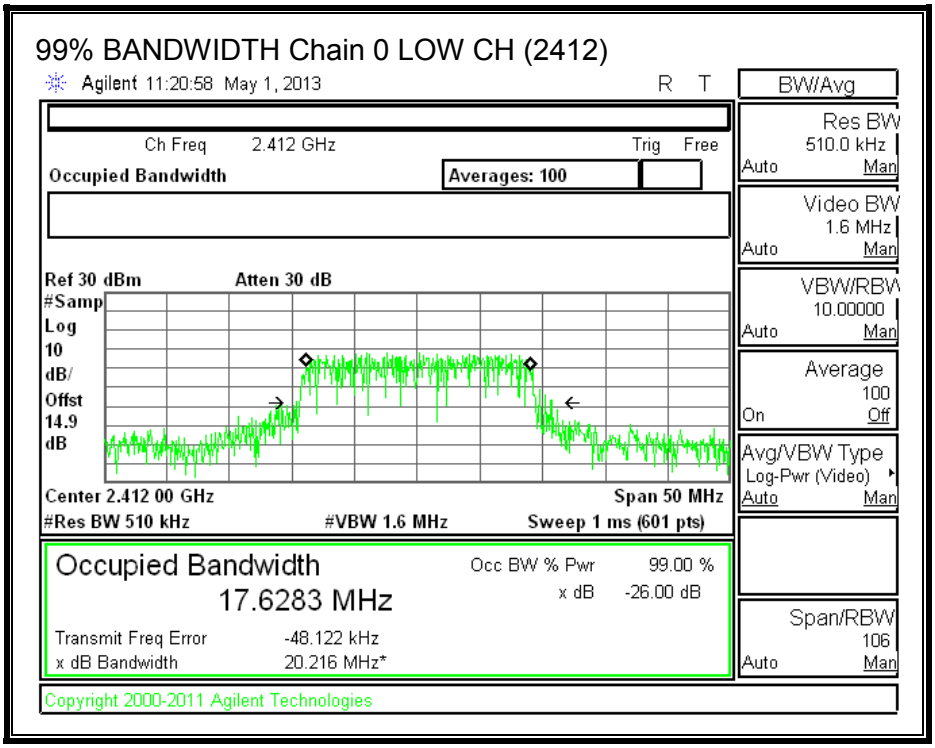
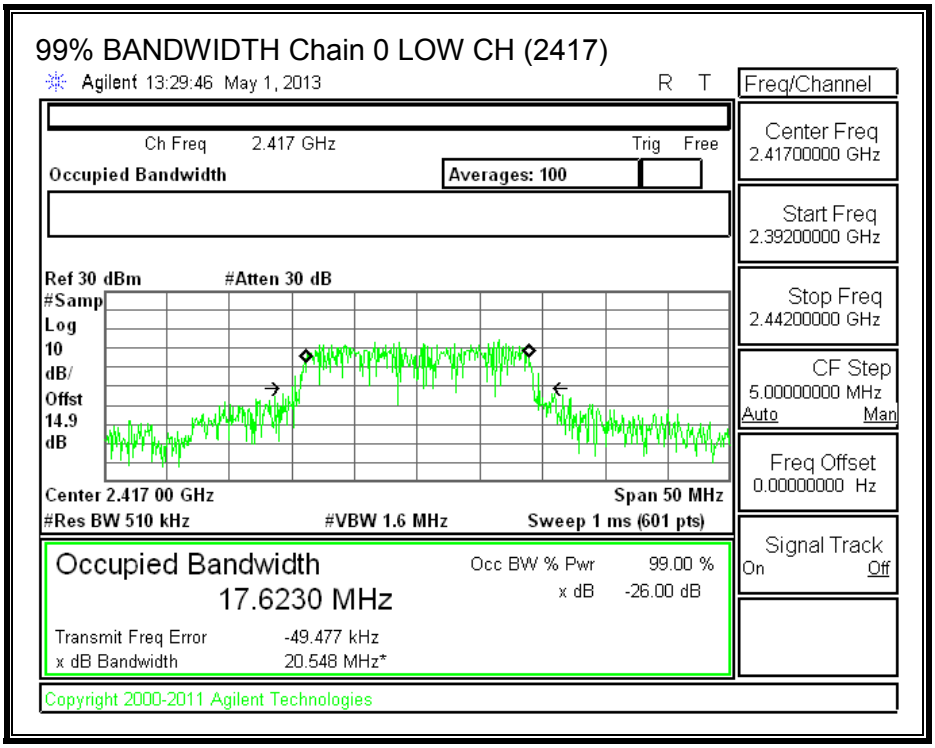
99% BANDWIDTH, Chain 0





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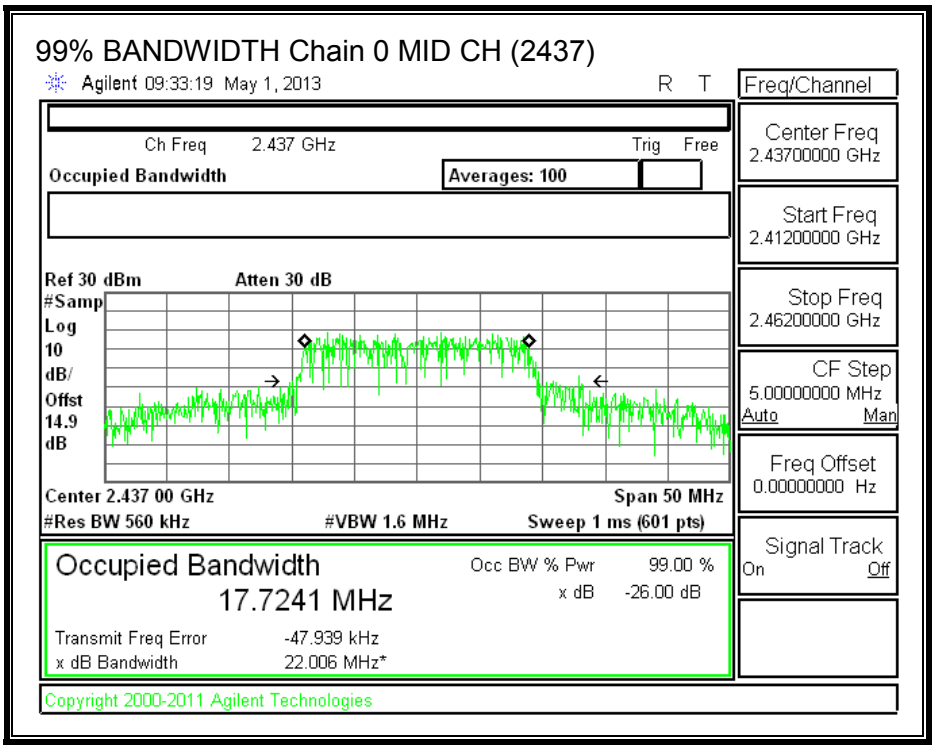

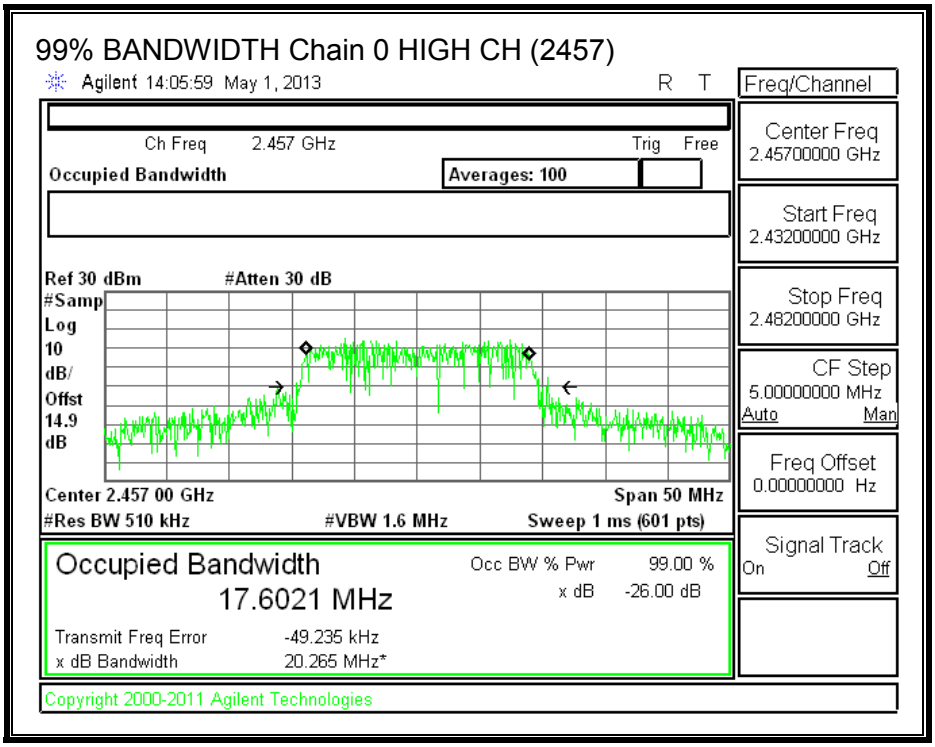

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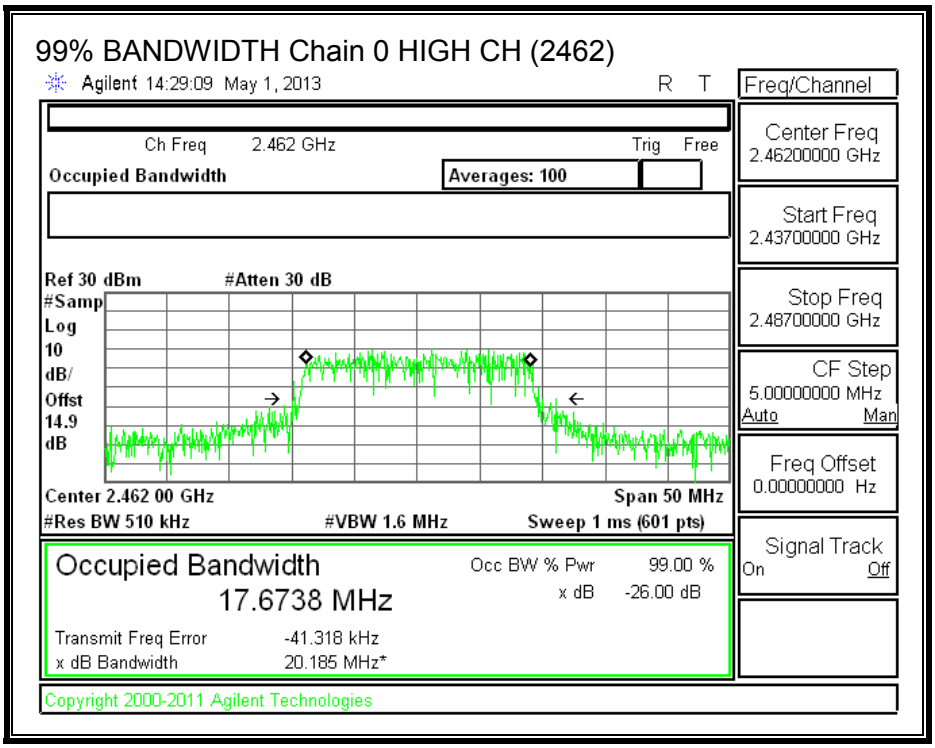
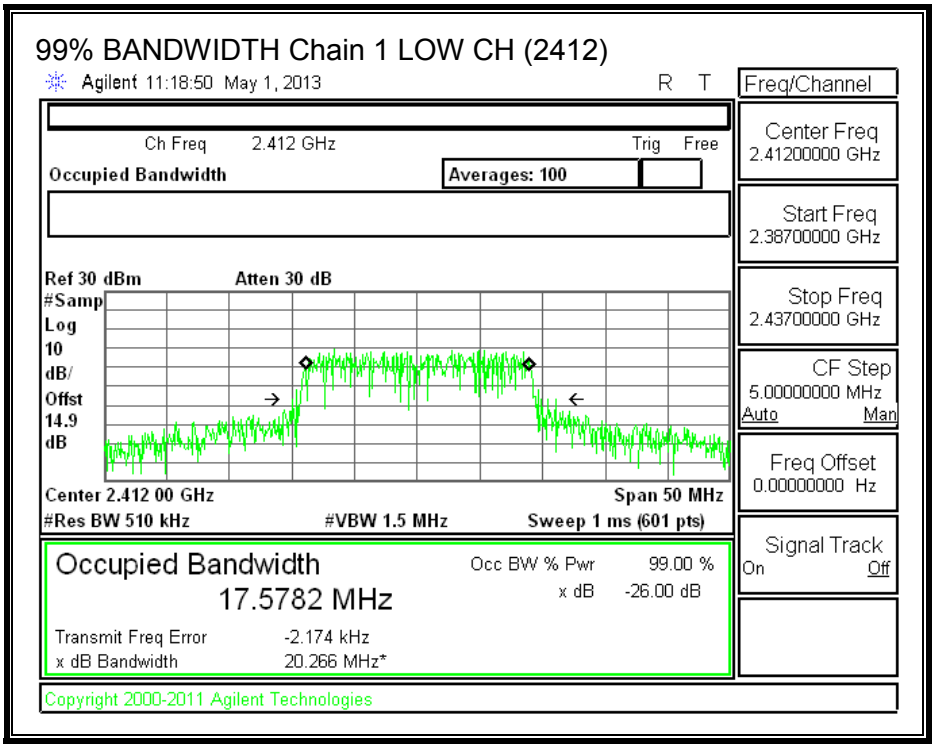


99% BANDWIDTH, Chain 1



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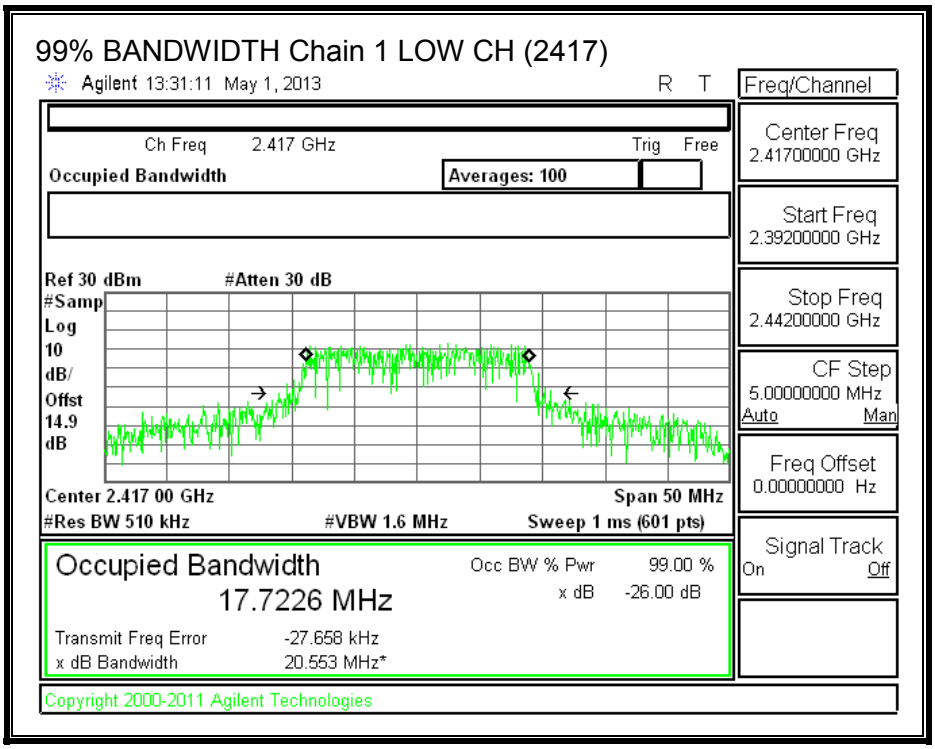

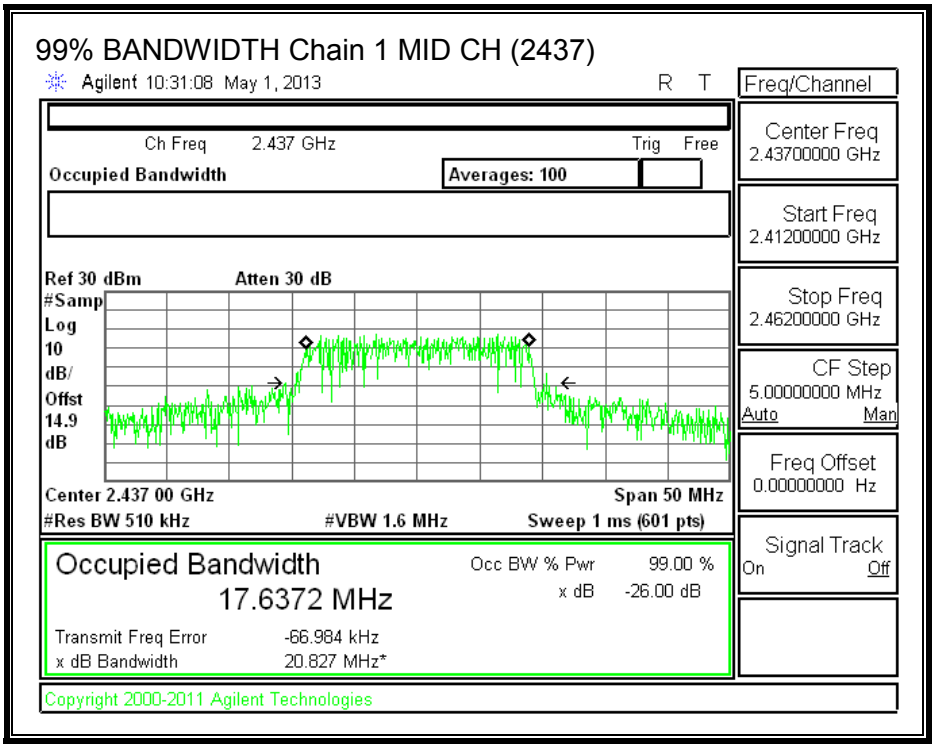

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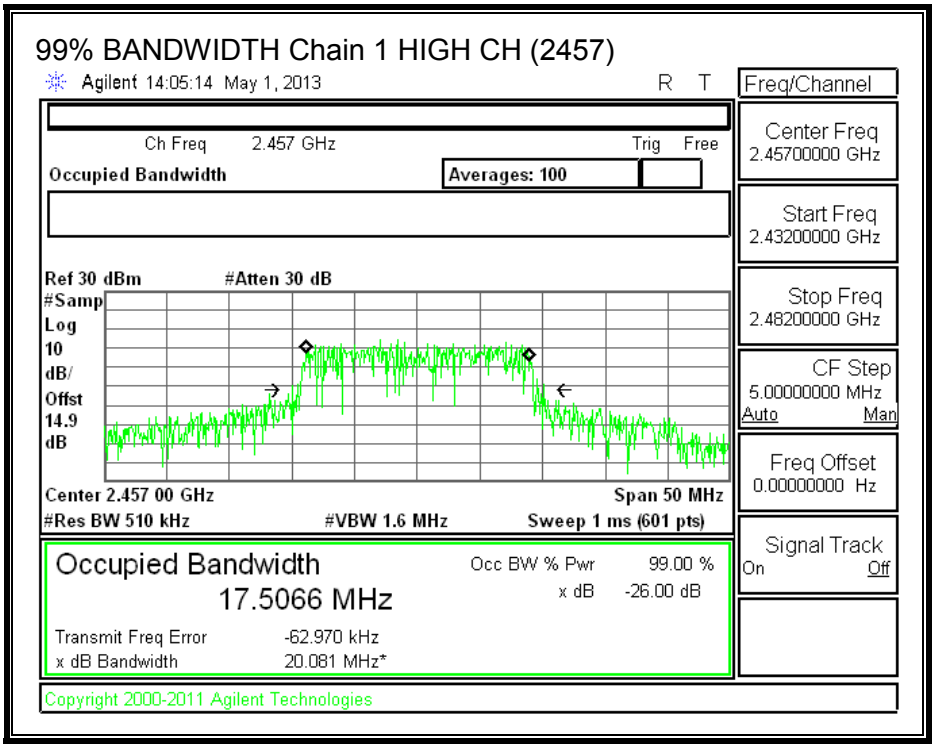

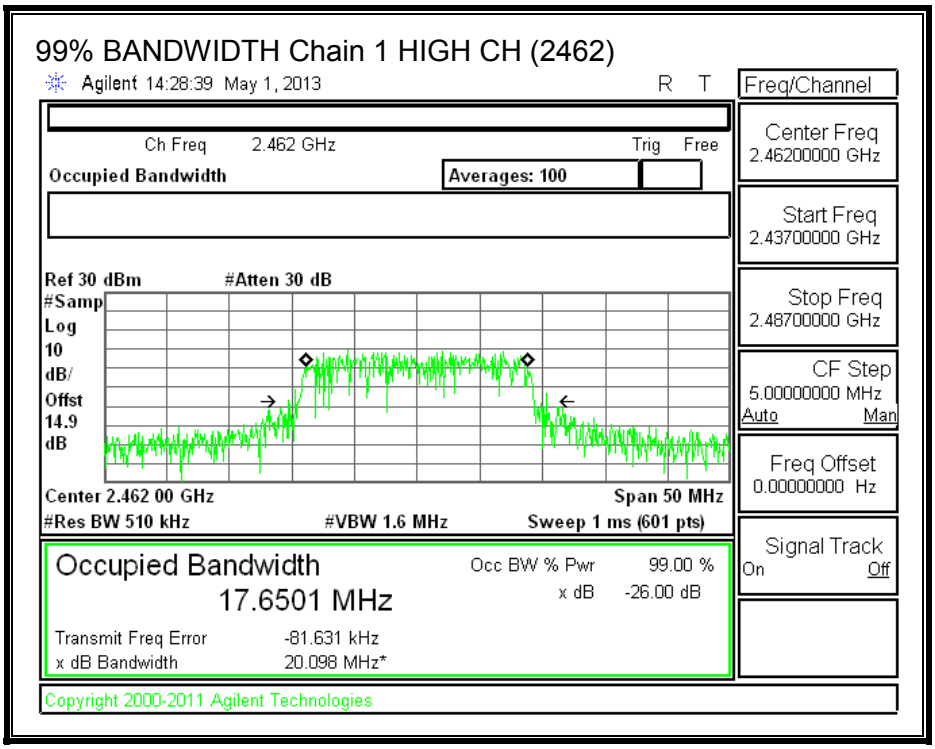

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8.3.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 14.88 dB (including 10 dB pad, power splitter 3.4 dB, and 1.48 cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	Chain 0 Power (dBm)	Chain 1 Power (dBm)	Total Power (dBm)
Low	2412	7.60	8.30	10.97
Low	2417	13.10	13.30	16.21
Mid	2437	17.50	17.60	20.56
High	2457	15.10	13.50	17.38
High	2462	8.80	8.10	11.47

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8.3.4. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is the same for each chain. The directional gain is equal to the antenna gain.

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
2.00	2.00	2.00

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RESULTS

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	2.00	30.00	30	36	30.00
Low	2417	2.00	30.00	30	36	30.00
Mid	2437	2.00	30.00	30	36	30.00
High	2457	2.00	30.00	30	36	30.00
High	2462	2.00	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margi (dB)
Low	2412	15.94	16.40	19.19	30.00	-10.81
Low	2417	20.78	21.16	23.98	30.00	-6.02
Mid	2437	25.78	24.76	28.31	30.00	-1.69
High	2457	22.24	20.68	24.54	30.00	-5.46
High	2462	17.30	16.46	19.91	30.00	-10.09

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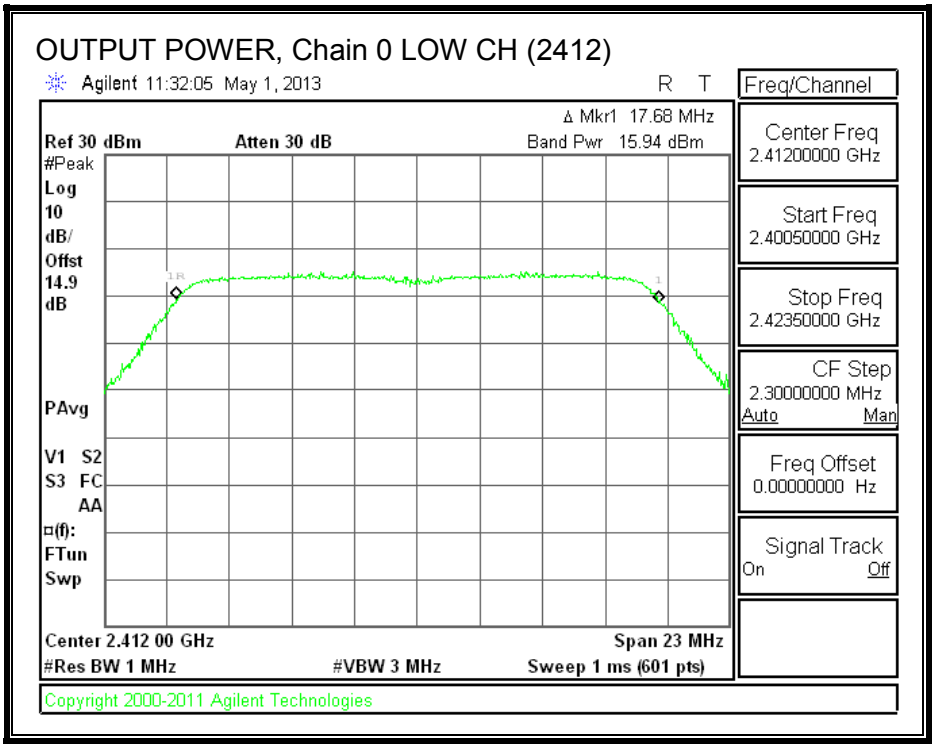
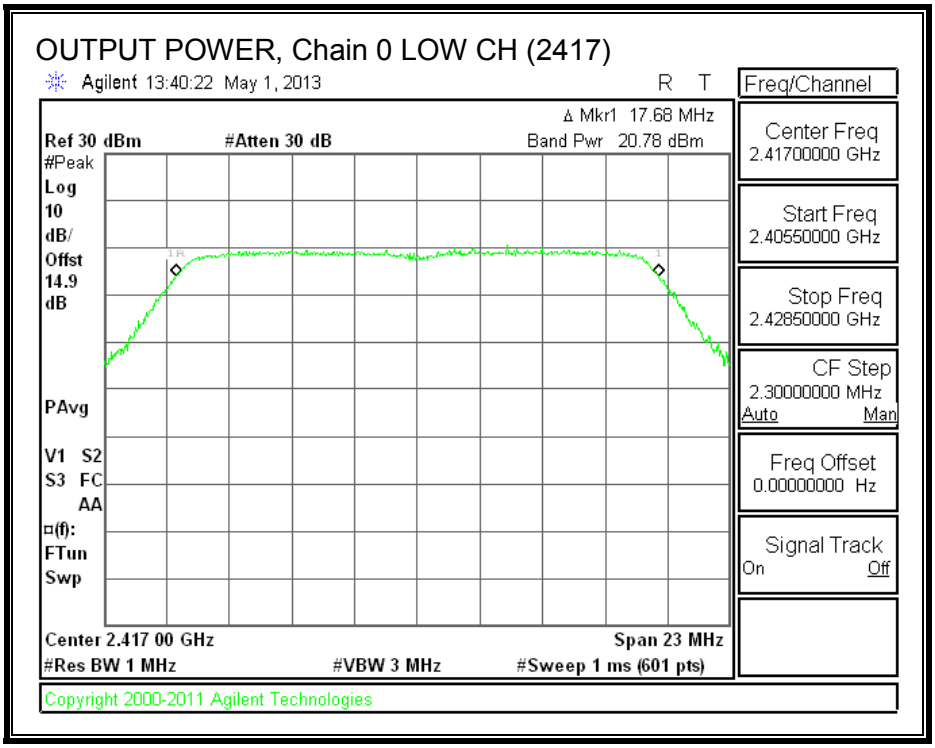
OUTPUT POWER, Chain 0





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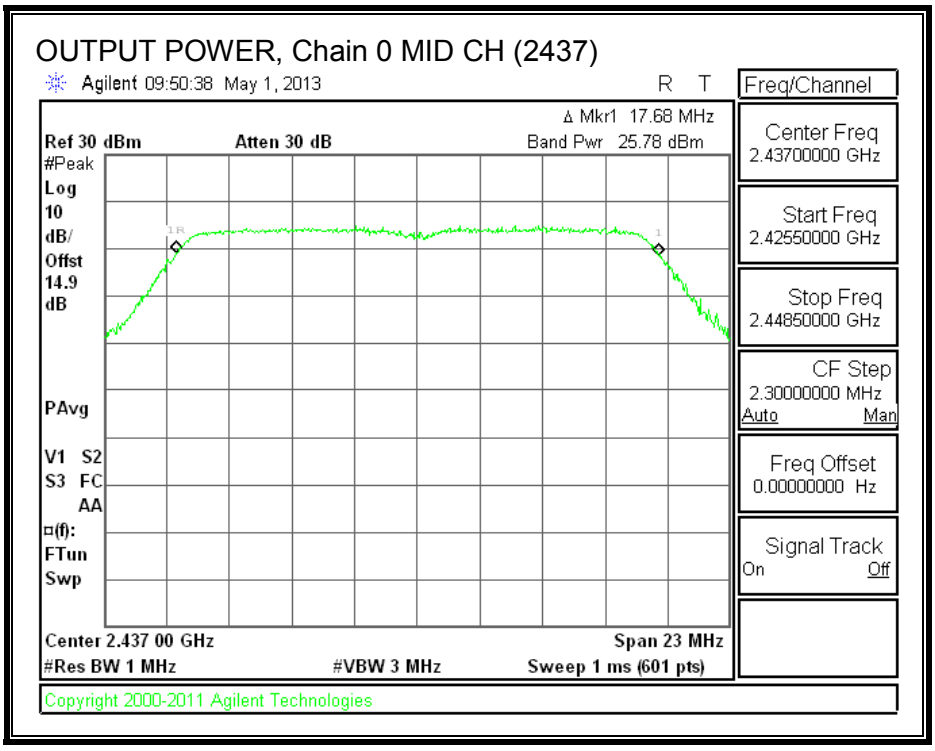

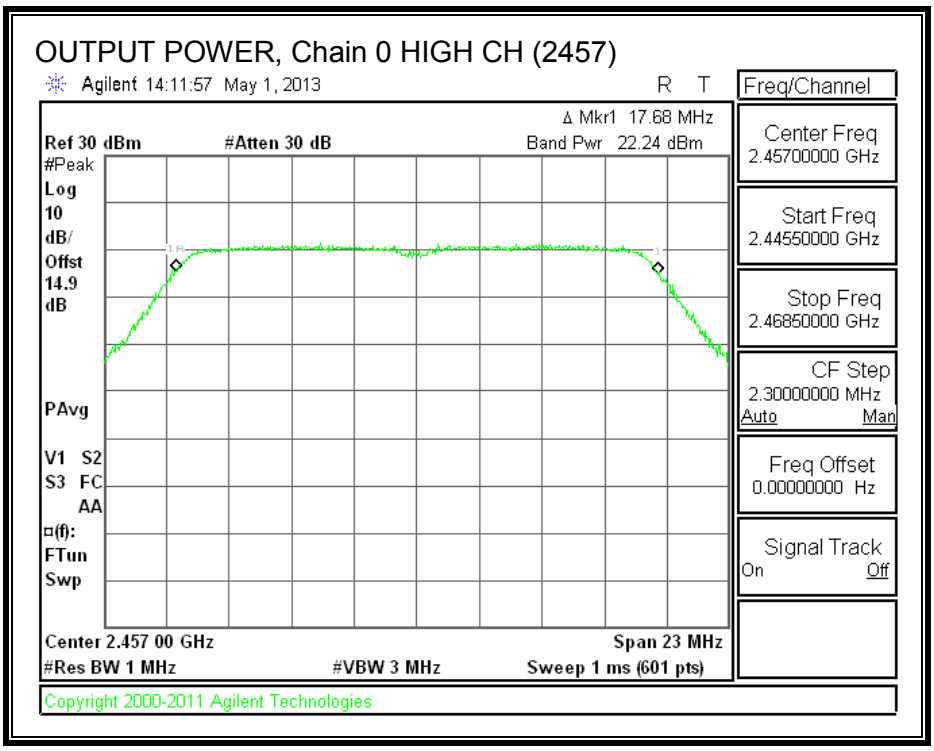

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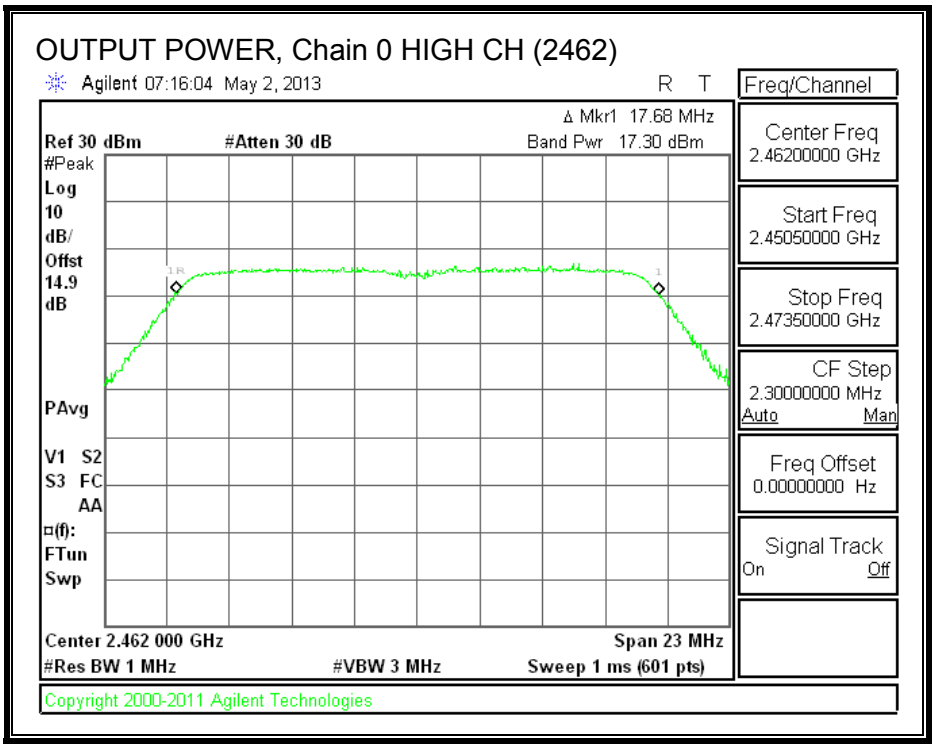
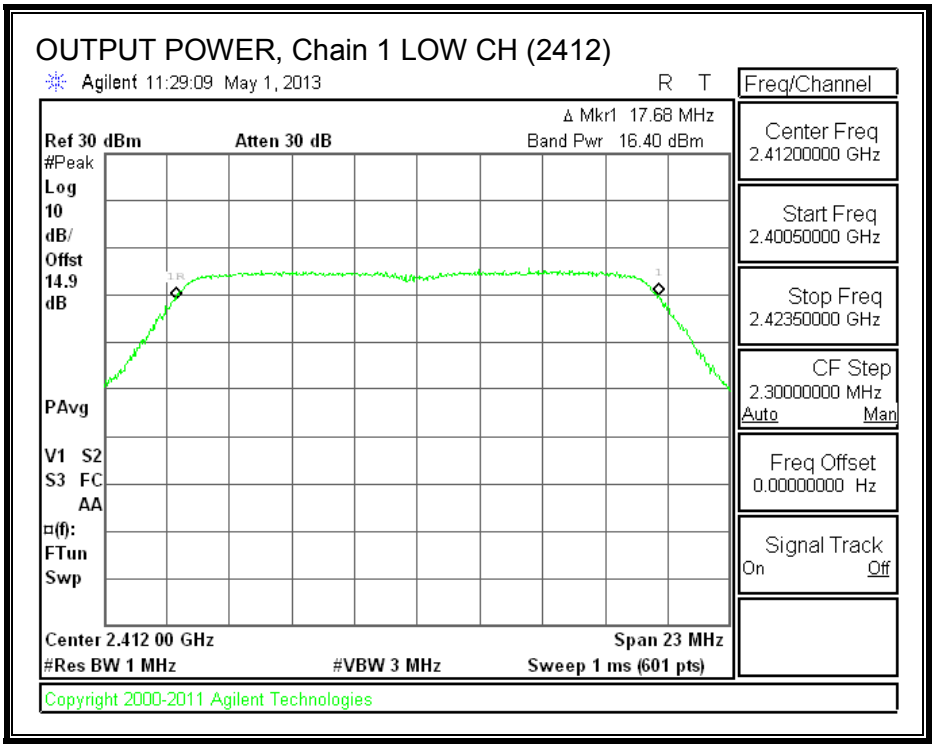


OUTPUT POWER, Chain 1



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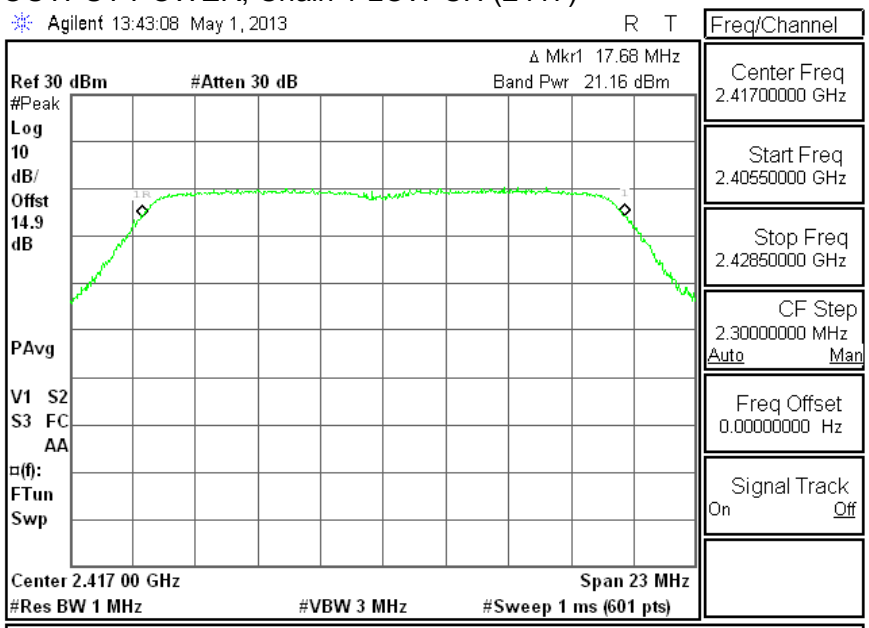
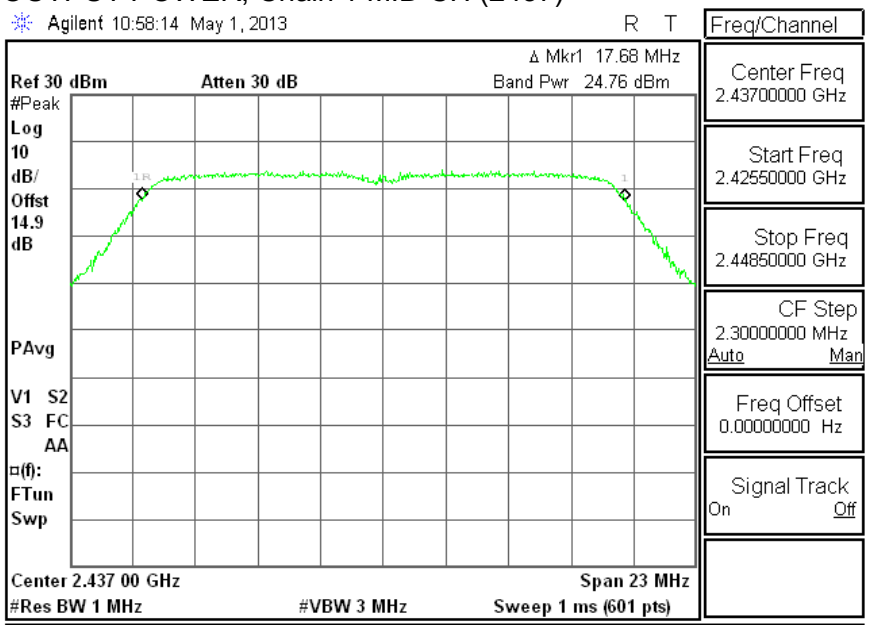
OUTPUT POWER, Chain 1 LOW CH (2417)



OUTPUT POWER, Chain 1 MID CH (2437)



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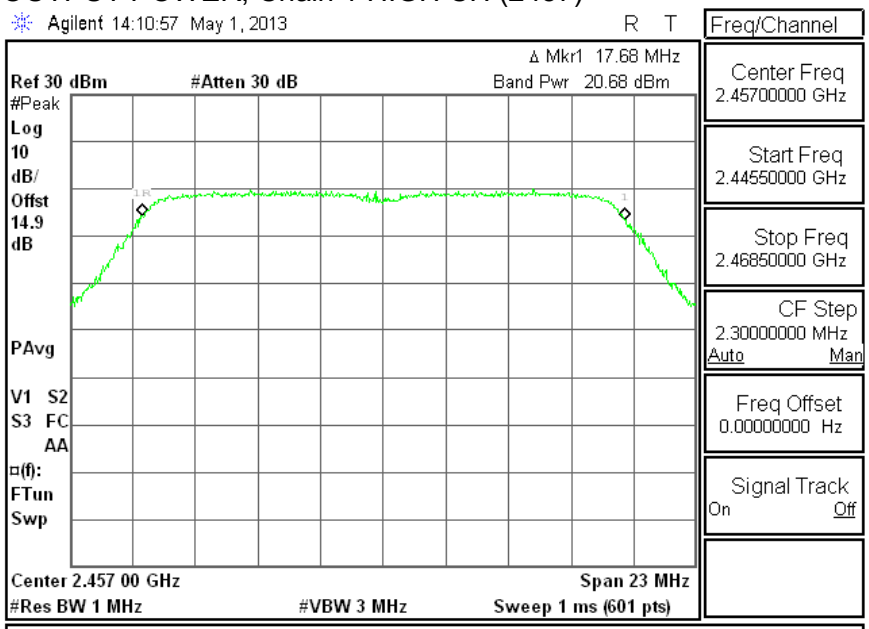
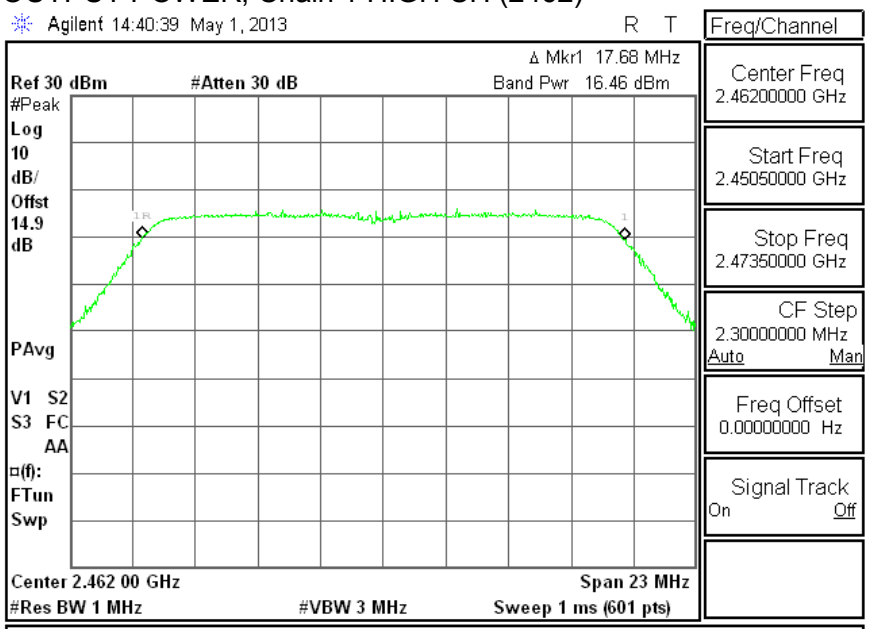
OUTPUT POWER, Chain 1 HIGH CH (2457)



OUTPUT POWER, Chain 1 HIGH CH (2462)



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8.3.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247

IC RSS-210 A8.2

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Chain 1 Meas (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-17.32	-16.56	-13.91	8.0	-21.9
Low	2417	-12.33	-12.34	-9.32	8.0	-17.3
Mid	2437	-7.52	-8.44	-4.95	8.0	-12.9
High	2457	-10.38	-12.44	-8.28	8.0	-16.3
High	2462	-16.61	-16.92	-13.75	8.0	-21.8

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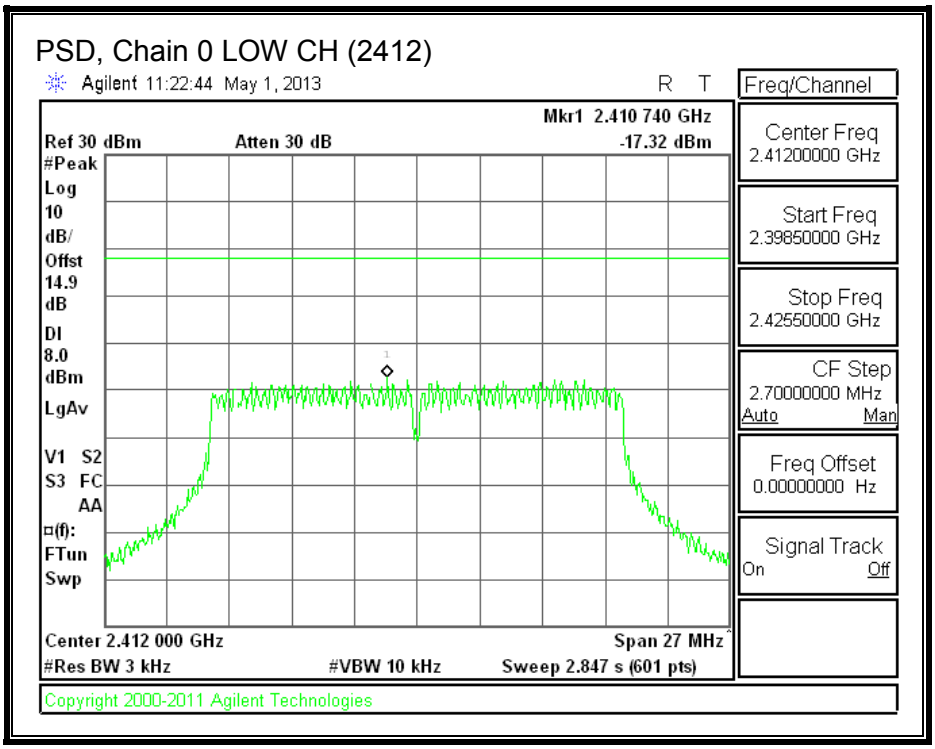
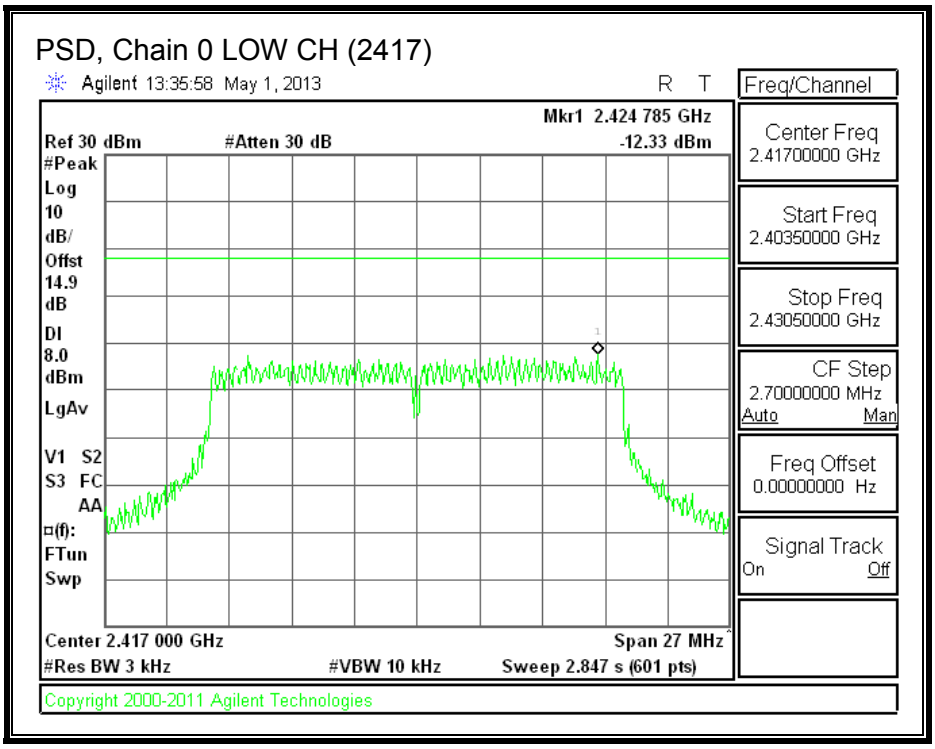
PSD, Chain 0





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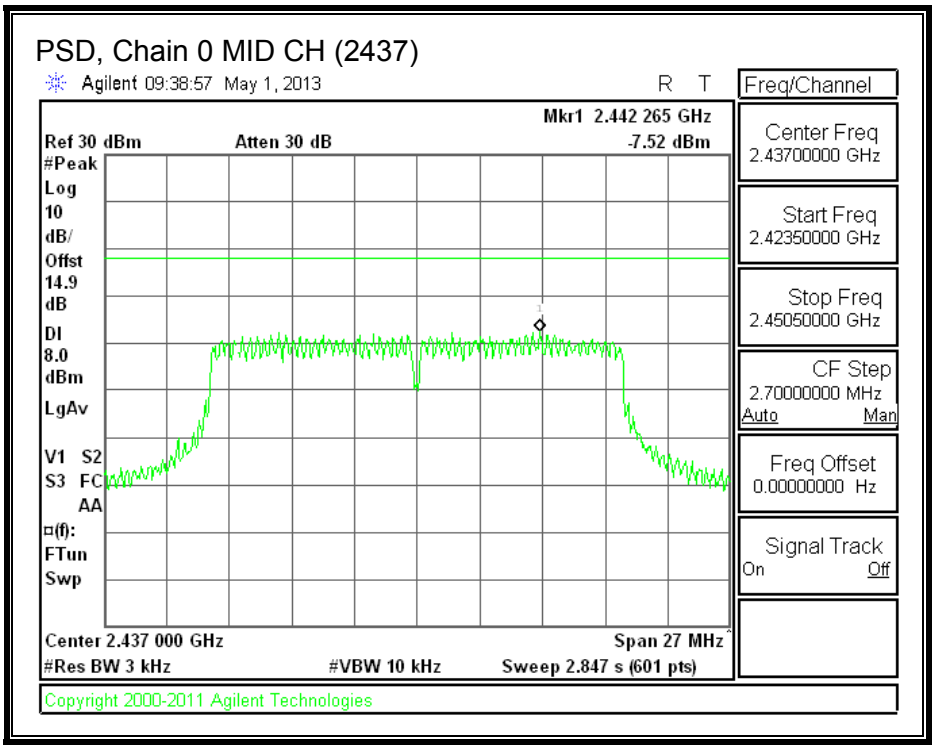

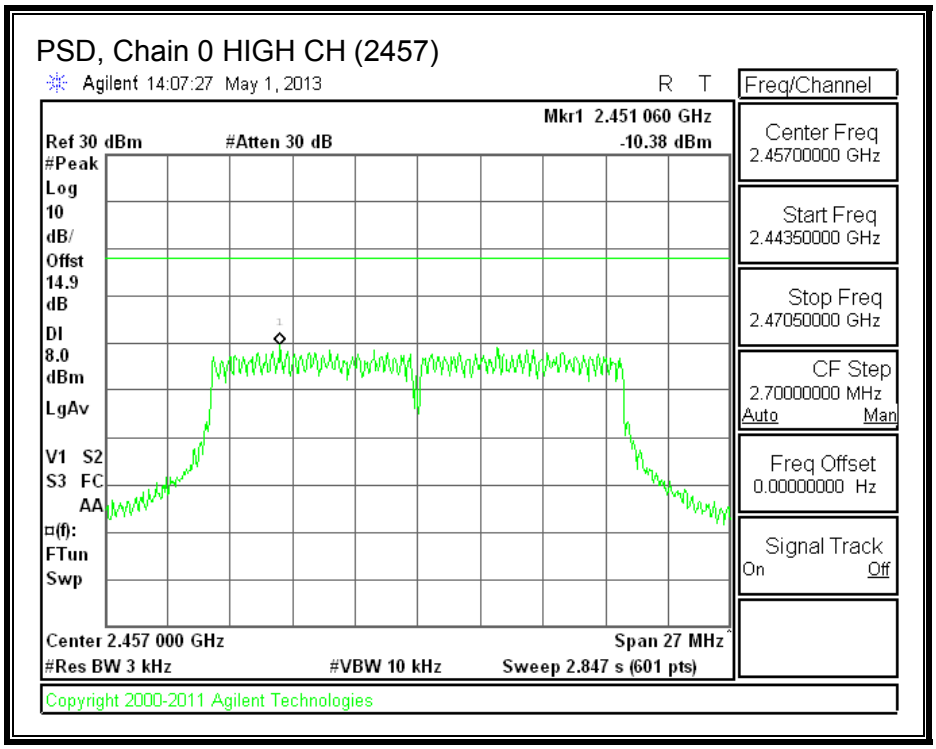

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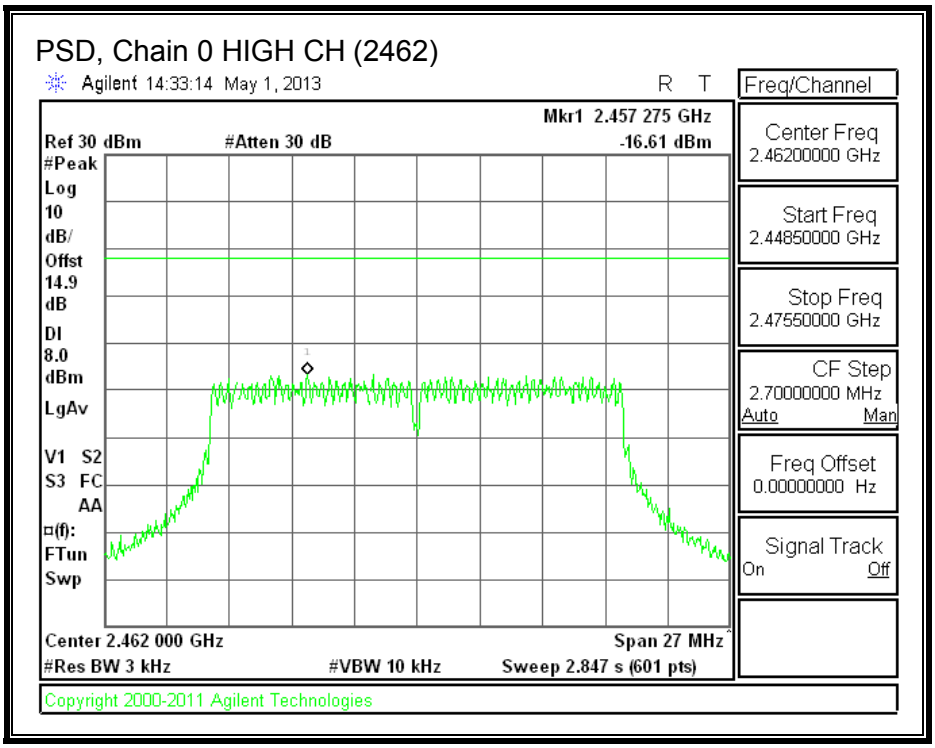
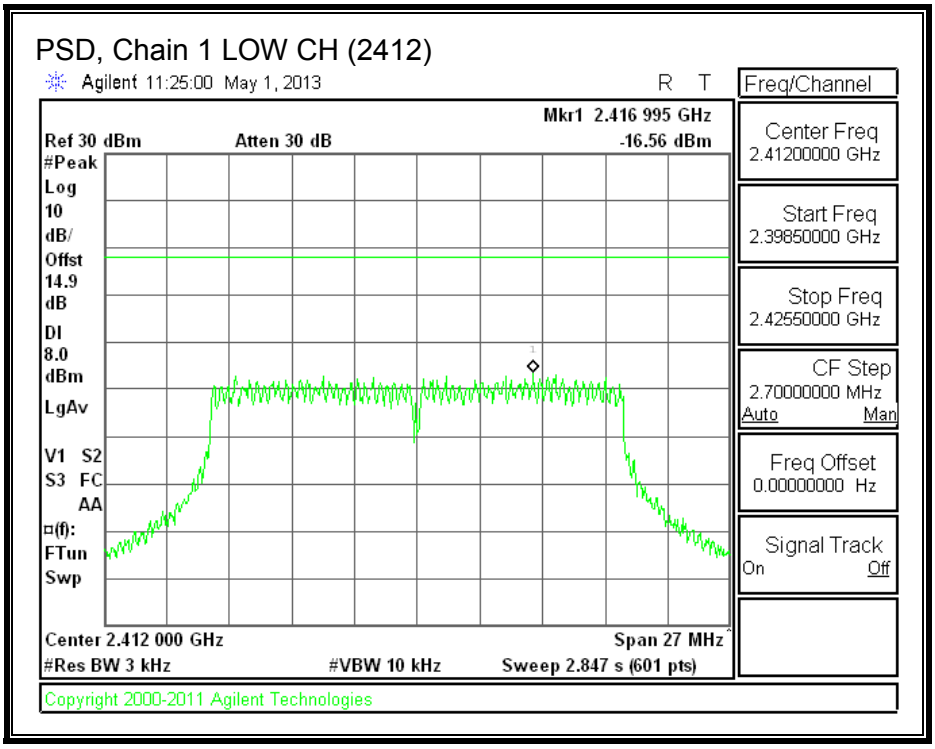


PSD, Chain 1



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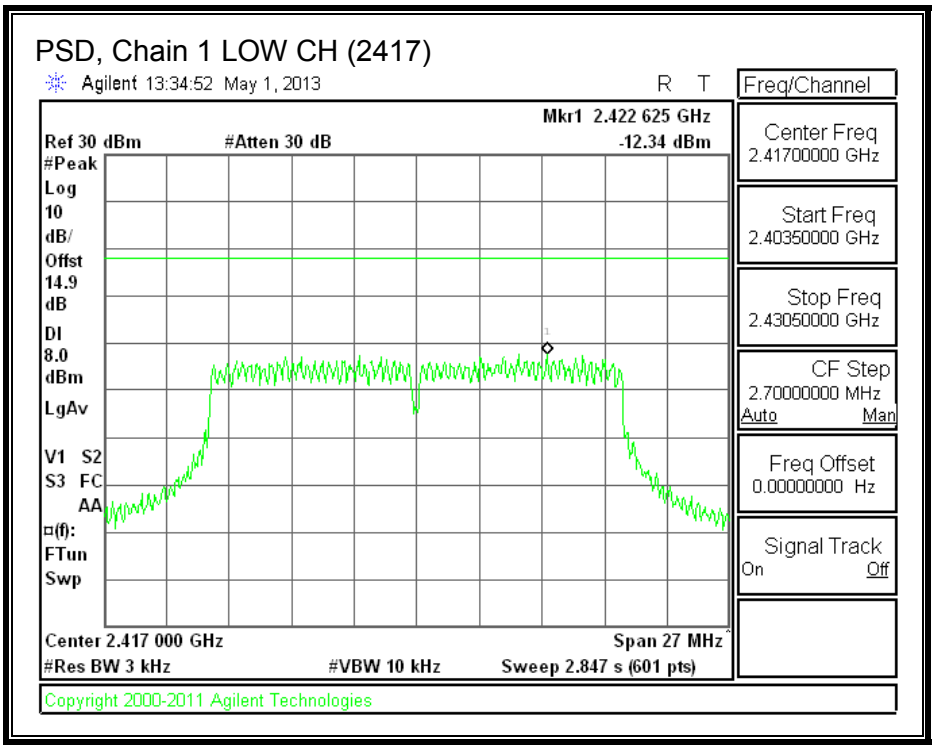
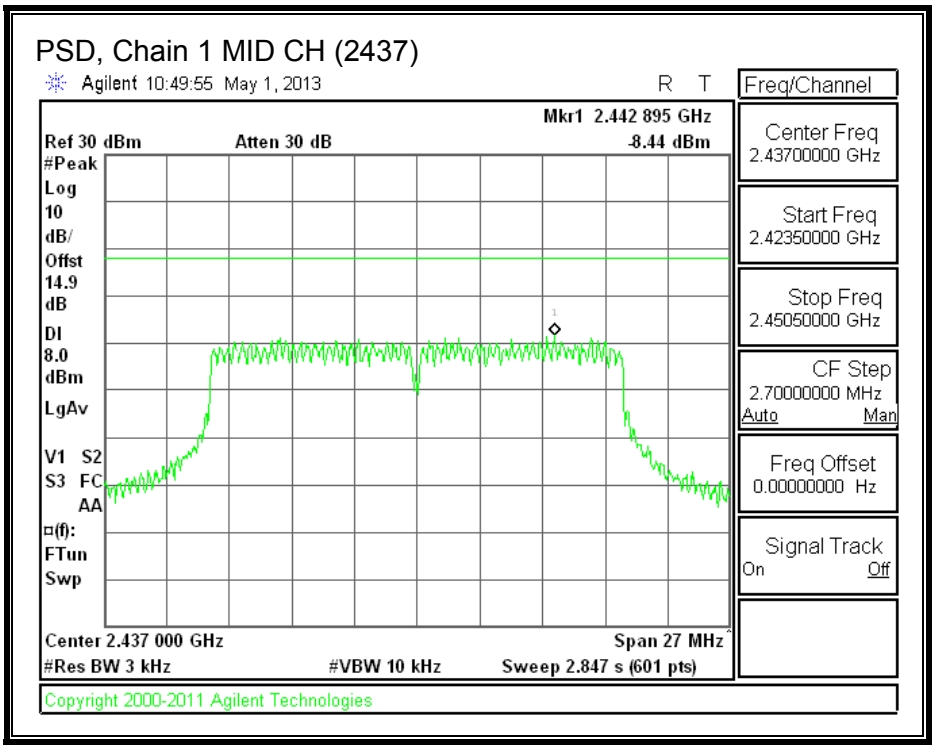
PSD, Chain 1 LOW CH (2417)



PSD, Chain 1 MID CH (2437)



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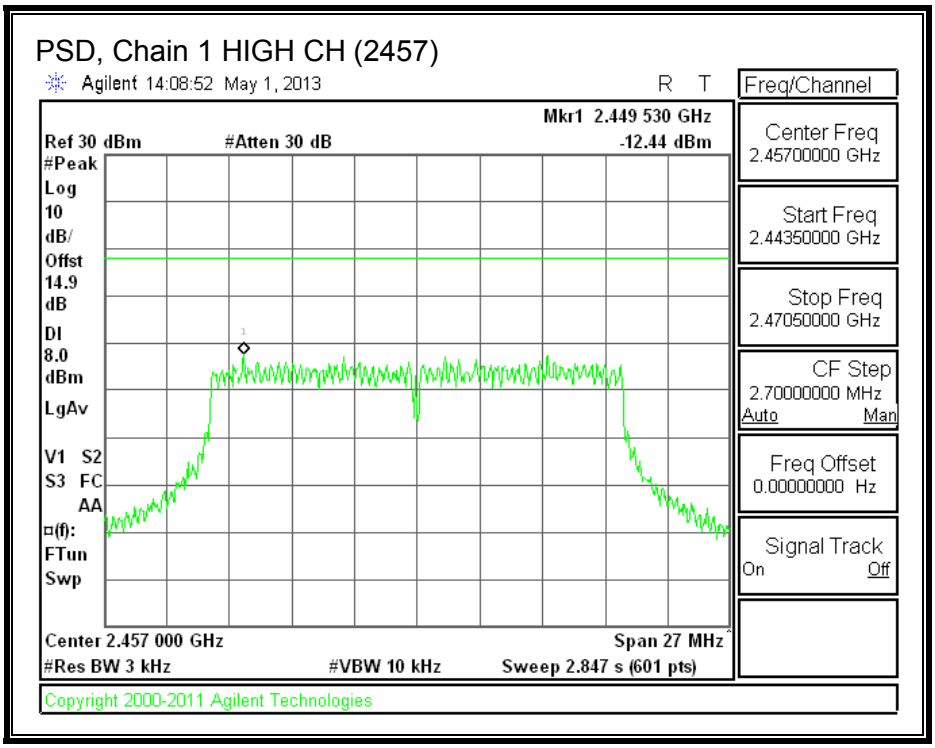
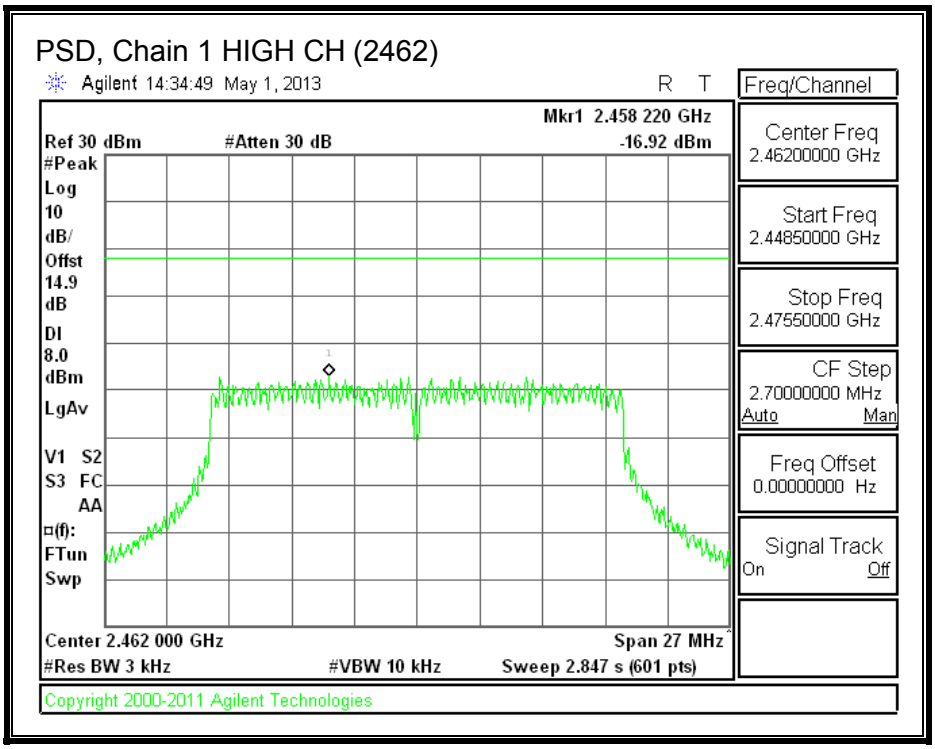
PSD, Chain 1 HIGH CH (2457)



PSD, Chain 1 HIGH CH (2462)



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8.3.6. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

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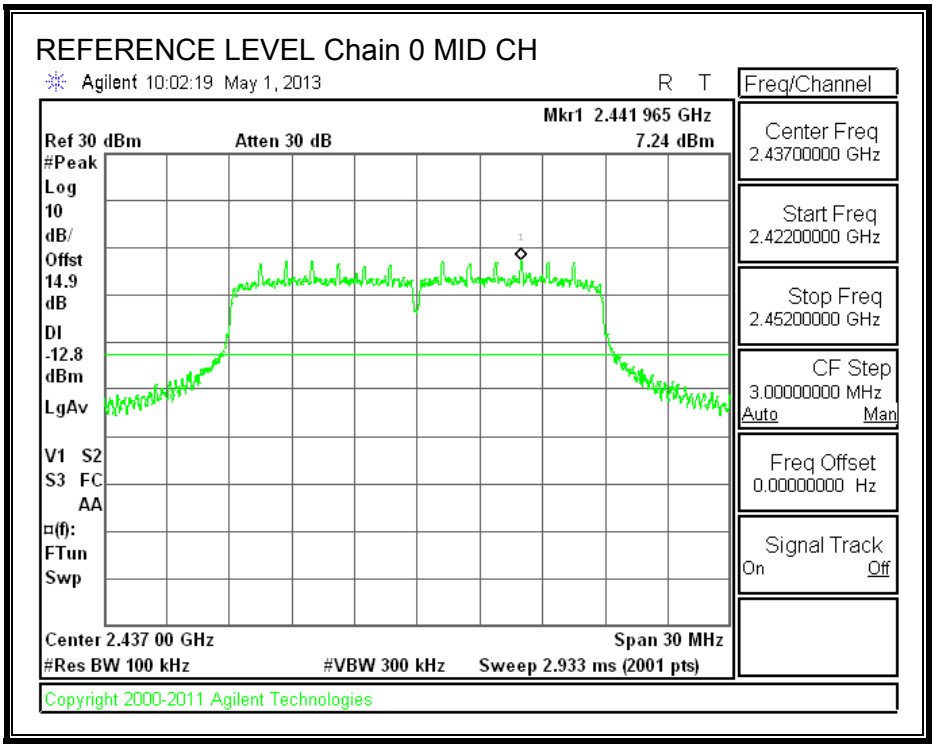
RESULTS

IN-BAND REFERENCE LEVEL, Chain 0



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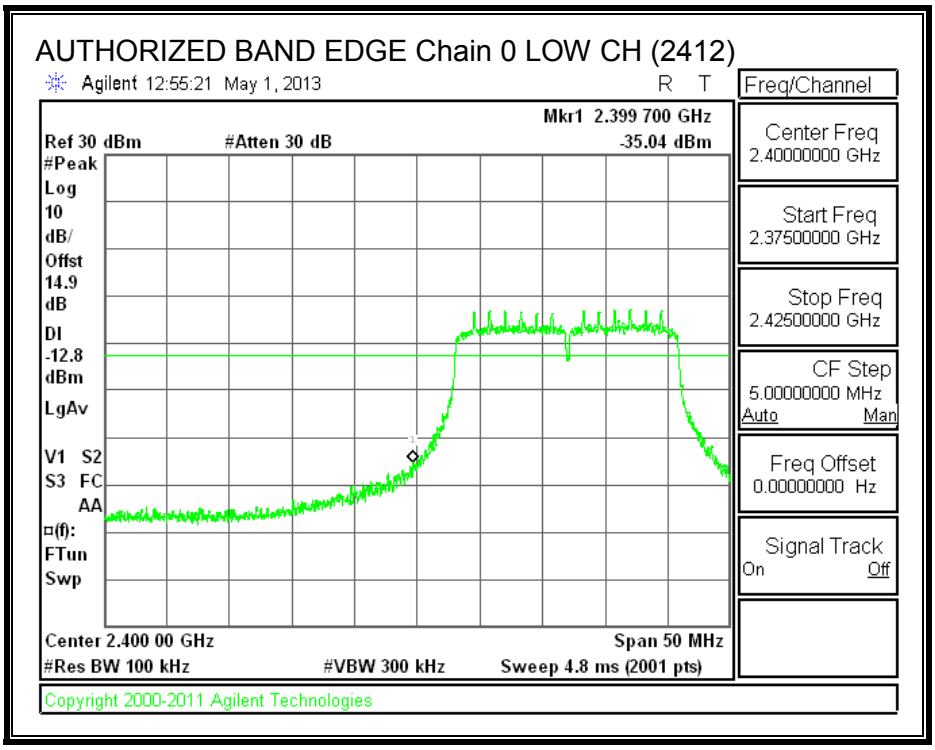
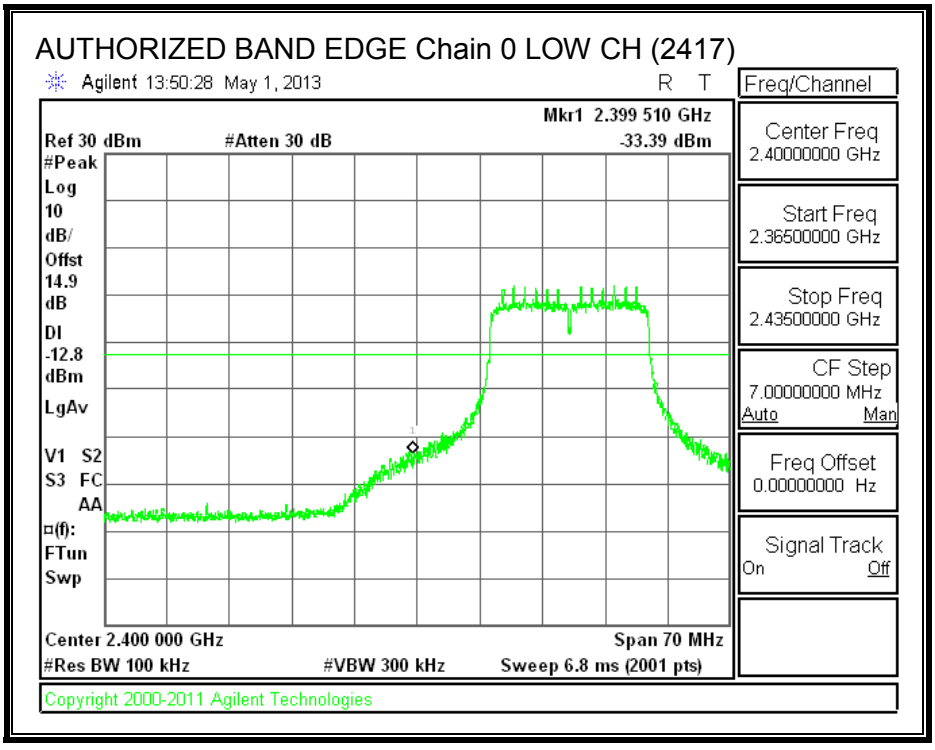
LOW CHANNEL BANDEDGE, Chain 0





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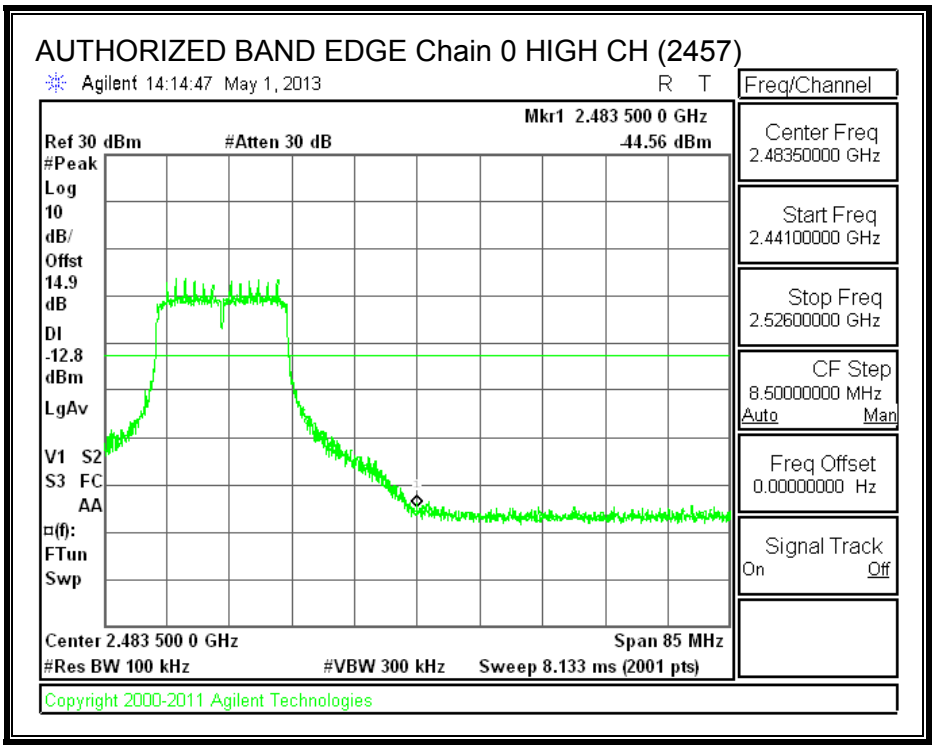
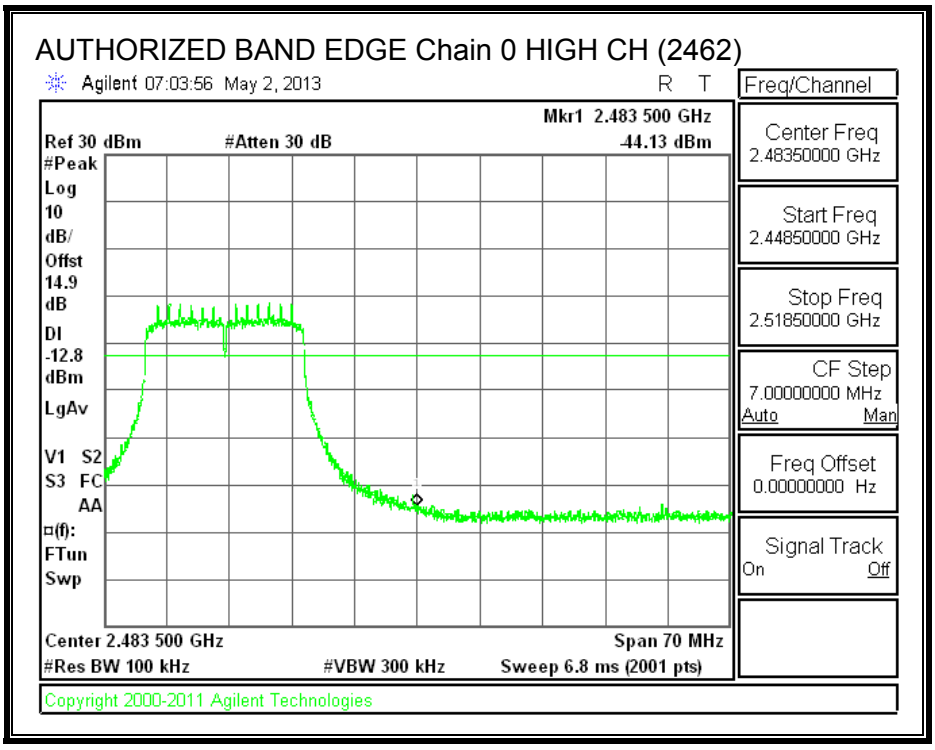
HIGH CHANNEL BANDEDGE, Chain 0





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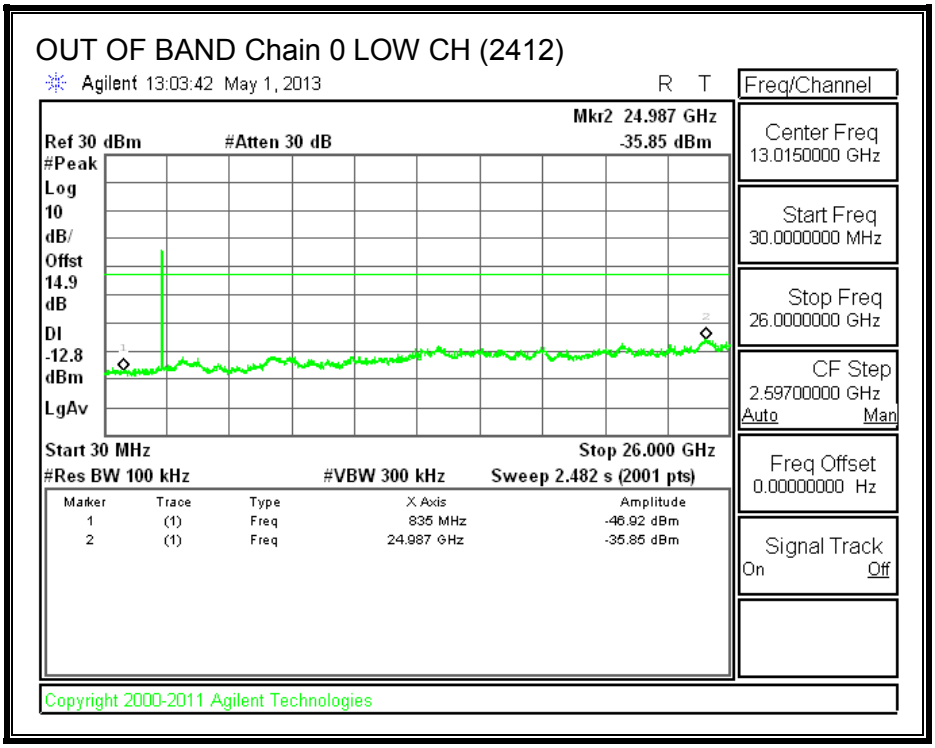
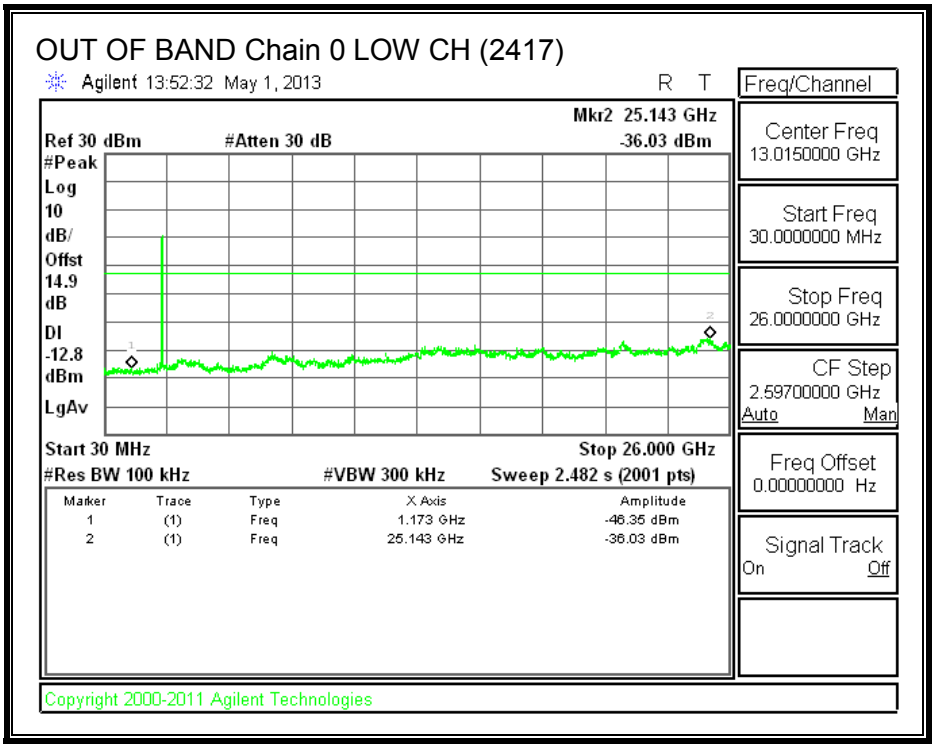
OUT-OF-BAND EMISSIONS, Chain 0





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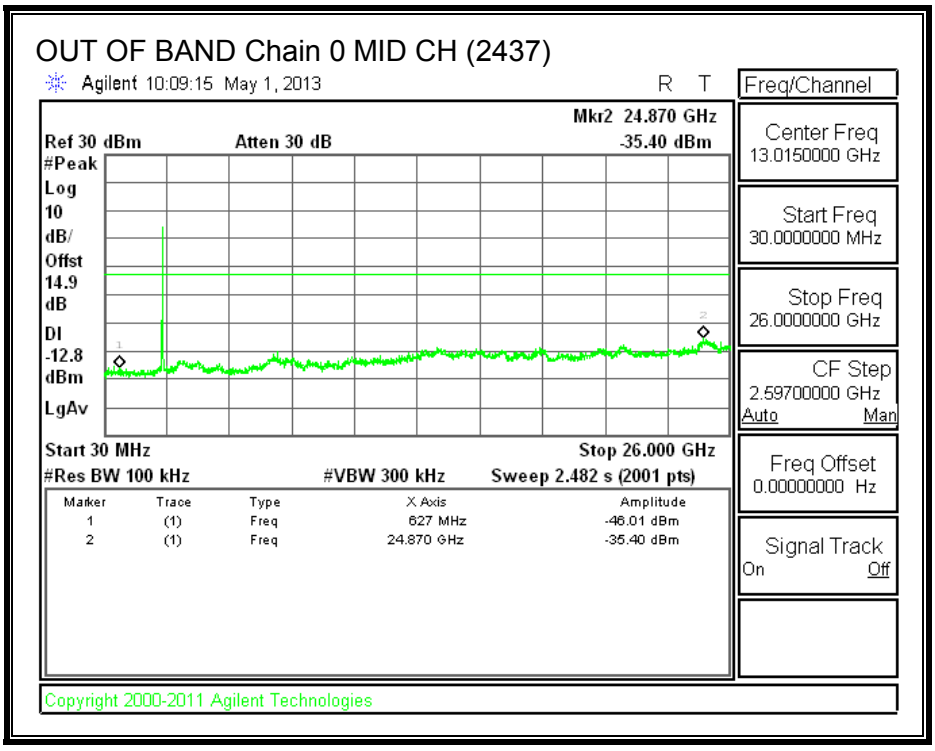

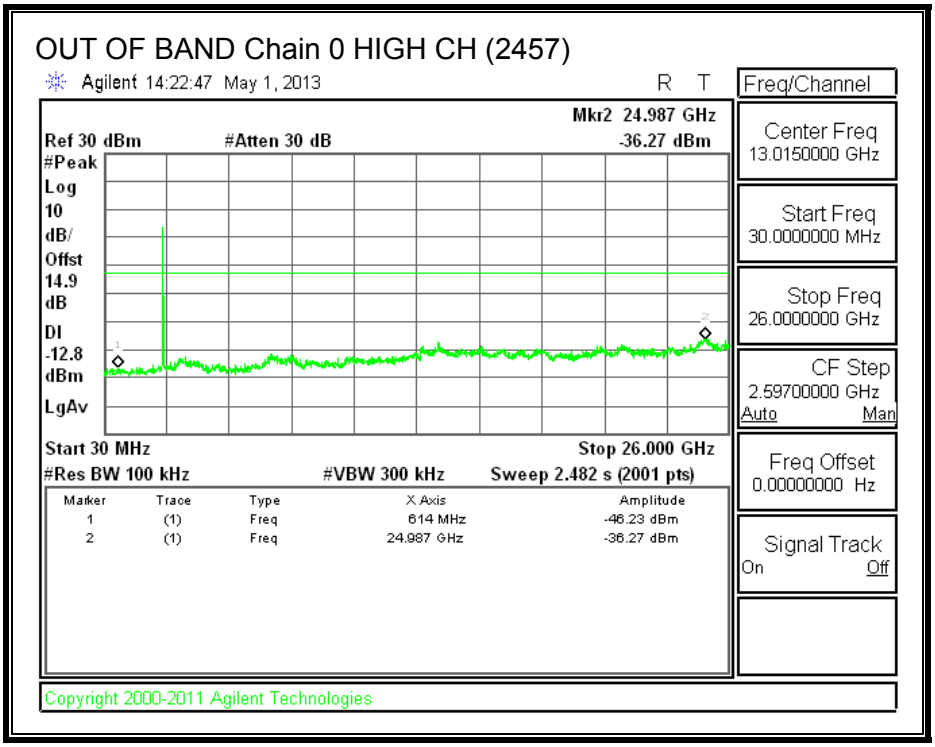

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